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ABSTRACT

This instructor's guide for an advanced beef unit contains 15 lessons that build on Agricultural Science I and II competencies. Introductory materials include lists of performance objectives and competencies for the complete unit, suggestions for motivational technique/interest approach and evaluation, lists of references and materials for the unit, and a competency profile. Contents of each lesson include the objective, study questions, reference list, teaching procedures (with a content outline and answers to evaluation), and the evaluation instrument. Some lessons also contain transparency masters, handouts, and/or worksheets. Lesson topics are: importance of the beef enterprise; cost of beef production; advantages of a beef enterprise; types of markets; marketing options; production strategies; local, state, and federal regulations; governmental programs; associations and organizations; breeding stock selection; breeding systems; beef facilities; beef herd health programs; feedstuffs for balanced rations; and pasture and roughage programs. (YLB)

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MISSOURI AGRICULTURAL EDUCATION

AG-37-I
AGDEX 420/00

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# Advanced Beef Unit

## for

# Advanced Livestock Production Curriculum

## Instructor's Guide

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Agricultural Education Section
Division of Vocational and Adult Education
Department of Elementary and Secondary Education
Jefferson City, Missouri



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Instructor's Guide

# ADVANCED BEEF UNIT

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This Advanced Beef unit, part of the Advanced Livestock Production curriculum, represents a major revision of the previous guide. Its modification was suggested by the MVATA Teaching Aids Committee.

Special thanks are due to Beef Advisory Committee members for providing their valuable time and suggestions in developing this unit. The Beef Advisory Committee consisted of Jim Bellis, Doug Carpenter, O. B. Clark, Ron Morrow, Mike Moyer, Doug Stewart and John Wallace.

A technical review of Lesson 13, Beef Herd Health Programs, was conducted by Bonnard Moseley of the University of Missouri-Columbia's Extension and Continuing Education staff. The selected readings was reviewed by Ron Morrow of UMC's Department of Animal Sciences.

Special recognition is also given to Harley Schlichting, director, and the staff at the Instructional Materials Laboratory for the typing and illustrating of this unit.

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Asst. editor/project coordinator
Instructional Materials Laboratory

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# FOREWORD

This unit replaces the previous beef unit in the Advanced Livestock Production curriculum. The selected readings which is available with this instructor's guide has been designed to supplement James R. Gillespie's Modern Livestock and Poultry Production, 2nd ed., as the student reference. In all, 15 lessons have been developed to build on Agricultural Science I and II competencies.

During the summer of 1981, the Missouri State Board of Education formally adopted the concept of "Instructional Management Systems" (IMS) as a priority for the 1981-82 school year. The Missouri Commissioner of Education has described the IMS concept as a practical way of "organizing for excellence" in education. To meet the demand for greater productivity and accountability, Dr. Frank Drake, Director of Vocational Education, applied the elements of IMS to form the "Vocational Instructional Management System" (VIMS). The VIMS process provides a framework to use in planning and organizing to assure excellence in Missouri's vocational educational system by focusing greater attention on the management of teaching and learning.

To aid vocational agriculture teachers in the implementation of VIMS, this guide incorporates the needed component parts to meet VIMS requirements. For ease of use, performance objectives and competencies have been included at the beginning of the unit, as well as being incorporated within each lesson. A competency profile has also been provided for convenient recordkeeping.

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University of Missouri-Columbia

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Department of Elementary and
Secondary Education

ADVANCED BEEF

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ADVANCED LIVESTOCK PRODUCTION

UNIT: ADVANCED BEEF

LESSONS

1. Importance of the Beef Enterprise
2. Cost of Beef Production
3. Advantages of a Beef Enterprise
4. Types of Markets
5. Marketing Options
6. Production Strategies
7. Local, State and Federal Regulations
8. Governmental Programs
9. Associations and Organizations
10. Breeding Stock Selection
11. Breeding Systems
12. Beef Facilities
13. Beef Herd Health Programs
14. Feedstuffs for Balanced Rations
15. Pasture and Roughage Programs

OBJECTIVES

1. The student will be able to determine the profitability of a beef enterprise.
2. The student will calculate the cost of production for a beef enterprise.
3. The student will evaluate the comparative advantages in labor vs. capital of the beef enterprise.
4. The student will be able to evaluate the major types of beef markets available.

5. The student will describe the marketing options available for beef cattle.

6. The student will identify production strategies that fulfill a chosen beef marketing strategy.

7. The student will identify local, state and federal regulations as they apply to beef production.

8. The student will be able to describe government programs and how they affect the beef industry.

9. The student will identify the different beef associations and organizations.

10. The student will be able to select breeding stock that will increase the productivity of a beef herd.

11. The student will be able to describe the different breeding systems for beef.

12. The student will be able to evaluate the different facilities for producing beef.

13. The student will be able to develop a herd health program for the different beef enterprises.

14. The student will evaluate feedstuffs for the most profitable ration.

15. The student will be able to plan a pasture and roughage program for profitable beef production.

*NOTE: Percent of accuracy should be set by instructors to reflect passing grade within their school system.

COMPETENCIES

1. Determine the profitability of a beef enterprise.

2. Calculate the cost of production for a beef enterprise.

3. Evaluate the comparative advantages (labor vs. capital) of the beef enterprise.

4. Evaluate the major types of beef markets available.

5. Describe the marketing options available for beef.

6. Identify production strategies that will fulfill the chosen beef marketing strategy.

7. Identify local, state and federal regulations as they apply to beef production.

8. Describe government programs and how they affect the beef industry.

9. Identify the different beef associations and organizations.

10. Select breeding stock that will increase the productivity of the beef herd.

11. Describe the different breeding systems for beef.

12. Evaluate the different facilities for producing beef.

13. Develop a herd health program for the different beef enterprises.

14. Evaluate feedstuffs for the most profitable balanced ration.

15. Plan a pasture and roughage program for profitable beef production.

MOTIVATIONAL TECHNIQUE OR INTEREST APPROACH

1. Project the cost and profit potential for the beef industry in the decade to come. How will this potential affect local and national farm income?

2. Relate today's beef industry with beef production in the year 2000. Discuss technological advances which may cause production to change. Look at how government programs will change the industry.

3. Compare the beef industry with other livestock segments of agriculture: dairy, sheep, swine and poultry. Discuss how labor, capital and management needs differ.

EVALUATION

1. Give short, objective tests following each lesson and a more in-depth objective test at the conclusion of the unit.

2. Observe the changes in behavior as evidence of an improved ability of students to deal with problems in this unit using background acquired from earlier units.

3. Observe students' attempts to solve similar problems in their supervised occupational experience programs.

REFERENCES AND MATERIALS

1. Student references

   a) Gillespie, James R. Modern Livestock and Poultry Production, 2nd ed. Albany, NY: Delmar, 1983.

   b) Advanced Beef Selected Readings

      Instructional Materials Laboratory
      10 Industrial Education Building
      University of Missouri-Columbia
      Columbia, MO 65211

   c) University of Missouri-Columbia Extension Division agricultural publications (optional)

      1) M65: Missouri Cattle Feeders Manual (1983)
      2) M75: Missouri Farm Planning Handbook (1986)
      3) M104: Beef Cow-Calf Manual (1987)

2. Teacher references

   a) Taylor, Robert E. Beef Production and the Beef Industry: A Beef Producer's Perspective. Minneapolis, Minn.: Burgess, 1984.

   b) Bundy, Diggins and Christensen. Livestock and Poultry Production, 5th ed. Englewood Cliffs, NJ: Prentice-Hall, 1982.

   c) Neumann, A. L.; Keith S. Lusby. Beef Cattle, 8th ed. New York: John Wiley & Sons, Inc., 1986.

   d) Minish, Gary L.; Dan G. Fox. Beef Production and Management. Reston, Va.: Reston Publishing Company, Inc., 1979.

   e) Ensminger, M. E. Animal Science, 6th ed. Danville, Ill.: The Interstate Printers & Publishers, Inc., 1969.

   f) University of Missouri-Columbia Extension Division agricultural publications

      1) G10: Information on Missouri's Beef Cattle Industry (1984)
      2) G781: So You Want to Farm (1986)
      3) G2075: Feed Additives for Beef Cattle (1984)
      4) G2082: Heifers vs. Steers in the Feedlot (1983)
      5) G2090: Growth Stimulants (Implants) (1984)
      6) G2110: Identifying and Treating Cattle Diseases, Part I (1980)
      7) G2111: Identifying and Treating Cattle Diseases, Part II (1980)

8) G2906: Purebred Livestock Registry Associations (1985)
9) G2911: Inbreeding: Its Meaning, Uses and Effects on Farm Animals (1986)

h) Beef Housing and Equipment Handbook (MWPS-6). Ames, Iowa: Midwest Plan Service, 1987.

i) Drover's Journal magazine. Shawnee Mission, Kan.: Vance Livestock Publications, October 1986. (Courtesy classroom copies are available.)

j) USDA Market News Summaries (Daily or weekly summaries are available from the Missouri Department of Agriculture, P.O. Box 630, Jefferson City, MO 65102.)

## Advanced Beef

# MAJOR COMPETENCY PROFILE

**Directions:** Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

**Rating Scale:**
- 3 **Mastered** - can work independently with no supervision
- 2 **Requires Supervision** - can perform job completely with limited supervision
- 1 **Not Mastered** - requires instruction and close supervision
- N **No Exposure** - no experience or knowledge in this area

| 3 | 2 | 1 | N |
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**Advanced Beef**

1. Determine the profitability of a beef enterprise.
2. Calculate the cost of production for a beef enterprise.
3. Evaluate the comparative advantages (labor vs. capital) of the beef enterprise.
4. Evaluate the major types of beef markets available.
5. Describe the marketing options available for beef.
6. Identify production strategies that will fulfill the chosen beef marketing strategy.
7. Identify local, state and federal regulations, as they apply to beef production.
8. Describe government programs and how they affect the beef industry.
9. Identify the different beef associations and organizations.
10. Select breeding stock that will increase the productivity of the beef herd.
11. Describe the different breeding systems for beef.
12. Evaluate the different facilities for producing beef.
13. Develop a herd health program for the different beef enterprises.
14. Evaluate feedstuffs for the most profitable balanced ration.
15. Plan a pasture and roughage program for profitable beef production.

_____

_____

## Advanced Beef

CLASS/SECTION: _____

| STUDENTS: | Determine the profitability of a beef enterprise. | Calculate the cost of production for a beef enterprise. | Evaluate the comparative advantages (labor vs. capital) of the beef enterprise. | Evaluate the major types of beef markets available. | Describe the marketing options available for beef. | Identify production strategies that will fulfill the chosen beef marketing stategy. | Identify local, state and federal regulations, as they apply to beef production. | Describe government programs and how they affect the beef industry. | Identify the different beef associations and organizations. | Select breeding stock that will increase the productivity of the beef herd. | Describe the different breeding systems for beef. | Evaluate the different facilities for producing beef. | Develop a herd health program for the different beef enterprises. | Evaluate feedstuffs for the most profitable balanced ration. | Plan a pasture and roughage program for profitable beef production. | |
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UNIT - ADVANCED BEEF

Lesson 1: Importance of the Beef Enterprise

Objective: The student will be able to determine the profitability of a beef enterprise.

Study Questions

1. **What advantages does Missouri have in beef production?**
2. **How does a beef enterprise use available land and labor effectively?**
3. **What factors must be considered before beginning a beef enterprise?**

References

1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

UNIT - ADVANCED BEEF

Lesson 1: Importance of the Beef Enterprise

TEACHING PROCEDURES

A. Introduction

Introduce the unit.

B. Motivation

Farmer Fran has 500 acres of land in Missouri and she wants to have a beef enterprise. Should she try to enter the beef industry in Missouri? What are the factors she must consider, and how should the beef enterprise fit into her farm plan?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students why they think Missouri ranks so high in cattle numbers. Tell them to consider any special conditions that exist in Missouri.

**What advantages does the state of Missouri have in beef production?**

a) Climate conditions for high grass potential
   1) Moisture
   2) Temperature
b) Location
   1) Missouri is a relatively high grain-producing state.
   2) Missouri is bordered by high grain-producing states.
c) Land
   1) Value
   2) Type
   3) Erosion

2. Ask students if there are any times of the year when the farm workload is slowed. Then ask the students if their farms include land that is not suitable for crop production. How do they use this land, if they do? Discuss the price of land and the need for utilization of it.

**How does a beef enterprise use available land and labor effectively?**

a) Cattle enterprises can utilize land and its resources that could not be harvested otherwise.
   1) Land unsuitable for row crops

2) Meadow growth after hay harvesting
3) Stalk fields

b) Cattle enterprises can utilize extra labor if managed accordingly.
1) Winter
(a) Providing feed and water
(b) Assisting with calving
2) Summer
(a) Harvesting hay and silage
(b) Treating animals for summer pests such as flies

3. Ask students what they would need to have a successful beef enterprise. Focus the students' attention in areas that would help them decide if they should start a beef enterprise of their own.

**What factors must be considered before beginning a beef enterprise?**

a) Resources
1) Capital
(a) Livestock
(b) Feed
(c) Miscellaneous costs
2) Feed
(a) Grain
(b) Hay
(c) Silages
(d) Pasture
3) Land
4) Labor
5) Facilities
6) Market

b) Knowledge
1) Livestock quality
2) Facilities
3) Regulations
4) Herd health
5) Production strategies
6) Markets

c) Profitability
1) Expected costs
2) Expected returns

F. Other activities

G. Conclusion

Missouri is an especially good state for a beef enterprise, but each individual should analyze the reasons to have a beef enterprise and the resources to support it.

H. Competency

Determine the profitability of a beef enterprise.

I. Answers to Evaluation

1. c
2. b

3. a) Climate conditions
   b) Location
   c) Land prices

4. Four of the following: capital, feed, land, labor, facilities and markets

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 1: Importance of the Beef Enterprise

EVALUATION

**Circle the letter that corresponds to the best answer in the first two questions.**

1. The expected profitability of a beef enterprise would be determined by the calculation of which of the following?

   a. Income and receipts
   b. Debts and expenses
   c. Costs and returns
   d. Labor and interest

2. Which of the following is efficiently utilized by a beef enterprise?

   a. Capital and machinery
   b. Land and labor
   c. Insects and weeds
   d. Crop storage facilities

3. What three conditions give Missouri an advantage in beef production?

   a.
   b.
   c.

4. List four resources that should be considered before entering a beef enterprise.

   a.
   b.
   c.
   d.

UNIT - ADVANCED BEEF

Lesson 2: Cost of Beef Production

Objective: The student will calculate the cost of production for a beef enterprise.

Study Questions

1. **What are the different types of beef enterprises?**
2. **What are some fixed and variable costs involved with each enterprise?**
3. **What factors should be included in planning a budget for each beef enterprise?**
4. **What returns can be expected from each beef enterprise?**

References

1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.
2. University of Missouri-Columbia Extension Division agricultural publications (optional)
   a) M65: Missouri Cattle Feeders Manual (1983)
   b) M75: Missouri Farm Planning Handbook (1986)
3. Transparency Master
   a) TM 2.1: Beef Enterprise Requirements
4. Work Sheet
   a) WS 2.1: Beef Enterprise Budget

UNIT - ADVANCED BEEF

Lesson 2: Cost of Beef Production

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Farmer Fran, from the last lesson, has decided that Missouri is a good place for her beef enterprise if she uses good management practices. She now has to decide on what type of beef enterprise to invest. How can she determine the best type of beef enterprise for her situation?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students to describe their beef enterprise or a beef enterprise with which they are familiar. Compare and contrast each situation.

**What are the different types of beef enterprises?**

a) Cow-calf enterprise
   1) Purebred breeder
   2) Commercial producer
b) Stocker cattle enterprise
   1) Referred to as backgrounding
   2) Fed a growing rather than finishing ration
   3) Suited to grazing or feeding a high roughage ration
c) Feeder cattle enterprise
   1) Finished immediately
      (a) Cattle are brought to full feed and fed until finished for slaughter.
      (b) These cattle are usually the heavy feeders in high condition.
      (c) These operations are usually located where there are limited amounts of roughage and large amounts of grain.
      (d) Calves are grown for rapid gain and large, mature weights.
   2) Deferred finish
      (a) Cattle are provided a growing period before the finishing ration.

(b) This program involves retaining ownership of cattle after a stocker program for finishing.
(c) Cattle in this program are suited for marketing roughages, pastures and crop residues.
(d) In this program, cattle are provided a high roughage diet for the growing period and a high concentrate diet for the finishing period.

2. Ask students to list costs involved on beef farms. After they get a good list completed, ask the students if there are any costs that occur if the farm is not raising beef or stays the same with varying levels of production. Discuss the significance of both variable and fixed costs and list examples in each case.

**What are some fixed and variable costs involved with each enterprise?**

a) Fixed costs are costs unrelated to output volume and are incurred just because of being in business. Fixed costs are also known as ownership or overhead costs.
   1) Depreciation
      (a) Facilities
      (b) Equipment
   2) Interest
      (a) Land loans
      (b) Facility loans
      (c) Livestock purchase loans
      (d) Equipment loans
   3) Repairs
   4) Taxes
   5) Insurance

b) Variable costs are those costs that change as production varies over a specified period.
   1) Livestock
   2) Purchased feed
   3) Raised feed
      (a) Seed
      (b) Fertilizer
      (c) Herbicides
      (d) Pesticides
      (e) Fuel
      (f) Labor
      (g) Miscellaneous
   4) Machinery
   5) Veterinary services and medicine
   6) Utilities
   7) Miscellaneous

3. Discuss with the students what should be included in a beef enterprise budget. Also have the students consider why a budget will differ somewhat from the summary and why a budget may differ from year to year. Hand out WS 2.1 and determine feed prices that are

proper for the area and/or time. Use TM 2.1 to give the amounts of feed and expenses for the enterprise or have the students research amounts from a reliable source for more current costs. Have the students complete the work sheet.

**What factors should be included in planning a budget for each beef enterprise?**

a) Predicted physical needs
    1) Feed
    2) Materials
    3) Machinery
    4) Facilities
    5) Repairs
    6) Hired labor
    7) Utilities
    8) Other
b) Predicted prices
    1) Expenses
    2) Receipts
c) Value of the budget
    1) Estimating capital requirements
    2) Comparing enterprises

4. Ask students to relate the cash returns determined by the budgets in each beef enterprise. Compare returns with operating costs and investment costs. Ask students to consider other benefits received from the beef enterprise.

**What returns can be expected from each beef enterprise?**

a) Monetary
b) Utilization
    1) Non-salable roughage
    2) Land
    3) Labor

F. Other activities

Ask students to prepare more budgets to see the effects of varying expenses and market prices.

G. Conclusion

The success of a beef enterprise can be predicted by budgets, which help the producer to consider all aspects of the enterprise.

H. Competency

Calculate the cost of production for a beef enterprise.

I. Answers to Evaluation

1. S
2. C
3. F
4. C
5. F
6. c
7. a
8. b
9. d
10. c

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 2: Cost of Beef Production

EVALUATION

**Match the types of beef enterprises with the following beef production programs.**

1. _____ Backgrounding program
2. _____ Commercial producer program
3. _____ Immediate finishing program
4. _____ Purebred program
5. _____ Deferred finishing program

C - Cow-calf enterprise

S - Stocker cattle enterprise

F - Feeder cattle enterprise

**Circle the letter which corresponds to the best answer.**

6. In a budget, what do predicted prices determine?

   a. Feed requirements
   b. Machinery
   c. Expenses and receipts
   d. Materials needed

7. What is one expected result of a beef enterprise budget?

   a. Monetary return
   b. Water usage
   c. Land production
   d. Leisure time

8. What type of costs are unrelated to output volume?

   a. Feed costs
   b. Fixed costs
   c. Livestock costs
   d. Variable costs

9. What type of costs change as production varies over a specified period?

   a. Facility costs
   b. Fixed costs
   c. Insurance costs
   d. Variable costs

10. How should a budget be used?

a. To compare enterprises
b. To estimate enterprise requirements
c. All of the above
d. None of the above

# Beef Enterprise Requirements
## (per head)

| Item | Cow/Calf | Stocker | Deferred Finish (725 lbs. gain) | Finish Immediately (600 lbs. gain) |
|---|---|---|---|---|
| Corn | — | — | 50 bu. | 43 bu. |
| Protein, etc. | 120 lbs. | 100 lbs. | 450 lbs. | 550 lbs. |
| Corn silage | — | — | — | 3.25 tons |
| Mixed hay | — | .8 tons | — | — |
| Grass hay | 1.1 tons | — | 1.4 tons | .3 tons |
| Pasture | 11.4 AUM* | 5.5 AUM | 2.8 AUM | — |
| Machinery | $ 8 | $ 5 | $ 9 | $ 8 |
| Vet. & med. | $ 5 | $ 4 | $ 4 | $ 4 |
| Mat'ls/services | $13 | $12 | $17 | $17 |
| Utilities | $ 5 | $ 4 | $ 6 | $ 7 |

*AUM: Animal Unit Month (amount of pasture consumed by 1000-lb. animal for one month)

**Credit:** Compiled with information from Missouri Farm Planning Handbook (Manual 75) and Missouri Cattle Feeders Manual (Manual 65). University of Missouri-Columbia: College of Agriculture and Extension Division, 1983.

## BEEF ENTERPRISE BUDGET

**Type of Enterprise**_____

**EXPENSES**

A) Investment cost/head
purchase cost or (weight _____ x cost/lb. _____) = _____

| B) Feed cost/head | Amount | | Cost/unit | | Total cost |
|---|---|---|---|---|---|
| 1) Corn or equivalent | _____ | x | _____ | = | _____ |
| 2) Protein, salt, minerals, additives, etc. | _____ | x | _____ | = | _____ |
| 3) Corn silage | _____ | x | _____ | = | _____ |
| 4) Mixed hay | _____ | x | _____ | = | _____ |
| 5) Grass hay | _____ | x | _____ | = | _____ |
| 6) Pasture | _____ | x | _____ | = | _____ |
| Total feed cost/head (add total cost of 1 through 6) | | | | | _____ |

C) Other expenses/head

| | |
|---|---|
| 1) Machinery cost, feed preparation, etc. | _____ |
| 2) Veterinary and medicine | _____ |
| 3) Other livestock materials and services | _____ |
| 4) Utilities, insurance, repairs, misc. | _____ |
| 5) Death loss (A x 2%) | _____ |
| Total other expenses/head (add lines 1 through 5) | _____ |

D) Operating interest
[(B+C)/2+A] x interest rate ____ % _____

E) Total expenses/head (A+B+C+D) _____

F) Total enterprise expense (E x number of head) _____

**RECEIPTS**

G) Receipts/head
(selling weight _____ x selling price _____) _____

H) Total enterprise receipts (G x number of head) _____

I) Predicted profit or loss/head (G-E) _____

J) Predicted profit or loss of enterprise (H-F) _____

UNIT - ADVANCED BEEF

Lesson 3: Advantages of a Beef Enterprise

Objective: The student will evaluate the comparative advantages in labor vs. capital of the beef enterprise.

Study Questions

1. **How does each enterprise compare in terms of labor and capital requirements?**

2. **What factors should be considered in deciding whether to purchase or lease land?**

3. **What factors influence part-time versus full-time activity in a beef enterprise?**

References

1. Handout

   a) HO 3.1: Enterprise Chart

2. Work Sheet

   a) WS 3.1: Comparing Enterprises

3. "So You Want to Farm" (G781). University of Missouri-Columbia: Extension Division, 1986.

UNIT - ADVANCED BEEF

Lesson 3: Advantages of a Beef Enterprise

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Mr. Farmer is given the chance to purchase or lease a farm. He must first decide how to operate the farm. He prefers to work with beef cows but is open to other farm enterprises for the best income possible. What should Mr. Farmer do?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students what enterprises are common in the area. Help the students determine how much money a person needs to earn per year for an average standard of living. Hand out WS 3.1 to the students. Have them compare all enterprises on the same basis through the use of the work sheet. The students may determine requirements from another source, such as Manual 75. Have the students determine how much capital and labor would be required for their chosen enterprises. Also have the students compare size, labor and capital requirements of full-time enterprises. Discuss other uses of the enterprises compared. Distribute HO 3.1 for further comparison of enterprises.

**How does each enterprise compare in terms of labor and capital requirements?**

a) Considerations for use of work sheet
   1) Hours of labor needed are averages that may not be adequate for a single enterprise unit.
   2) Capital
      (a) Does not include cost of land
      (b) Does include cost of livestock
      (c) Does not include initial equipment cost

b) Comparing enterprises
   1) What enterprises require the least and most capital to operate?
   2) What enterprises require the least and most labor?
   3) What enterprises provide the least and most net returns?
   4) How can a beef enterprise fit into a farm program?

2. Ask the students to consider the land options open to beef enterprises. Keep in mind the financial situation of beef enterprises.

**What factors should be considered in deciding whether to purchase or lease land?**

a) Effects on the cash flow
   1) The result of a land purchase is calculated by subtracting interest and principle payments from the enterprise's net returns.
   2) The result of a land lease is calculated by subtracting interest (if the rent is borrowed) and rent payments from the enterprise's net returns.

b) Related financial considerations
   1) Taxes
   2) Land appreciation
   3) Credit
      (a) Money borrowed to purchase land cannot be used for other purposes.
      (b) Owned land may serve as collateral to increase borrowing power.

3. Ask the students if their families have beef cattle. Ask them what part of the farm's total income is from the beef enterprise--all, half or part. Now ask if everyone who has a beef enterprise is a full-time beef producer. Have the students determine how to classify beef enterprises.

**What factors influence part-time versus full-time activity in a beef enterprise?**

a) A full-time beef enterprise provides the major portion of the family's or individual's income.

b) Part-time beef enterprise
   1) A part-time enterprise results when the major income is from an off-farm job.
   2) A retirement enterprise helps keep the retired individual active.
   3) A companion enterprise complements other farm enterprises to utilize unused resources and market other farm products.

F. Other activities

G. Conclusion

A beef enterprise requires considerable capital but provides low net returns. On the other hand, it requires little labor and serves as a good companion enterprise to fully utilize farm resources.

H. Competency

Evaluate the comparative advantages (labor vs. capital) of the beef enterprise.

I. Answers to Evaluation

1. b
2. d
3. d
4. Buying
5. a

J. Answers to work sheet

NOTE: These figures assume a $20,000 yearly income and are based on estimates from WS 3.1.

| | | Beef Cow, spring calf | Background calf through summer | Deferred finish calf | Immediate finish calf | Dairy (12,500 lbs. milk/cow) | Sow and 12 market hogs | Sow and 12 65-lb. feeder pigs |
|---|---|---|---|---|---|---|---|---|
| **REQ./UNIT** | | | | | | | | |
| Capital Needed | C | 703.00 | 505.00 | 703.00 | 738.00 | 2,666.00 | 1,266.00 | 707.00 |
| Labor Required | D | 6 | 1 | 5 | 3 | 50 | 28 | 20 |
| Extended Net Return | E | 70.00 | 5.00 | 12.00 | 5.00 | 310.00 | 346.00 | 190.00 |
| **REQ./ENTERPRISE** | | | | | | | | |
| Size for Income | F | 286 | 4,000 | 1,667 | 4,000 | 65 | 58 | 105 |
| Labor (hours) | G | 1,716 | 4,000 | 8,335 | 12,000 | 3,250 | 1,624 | 2,100 |
| Total Capital | H | 201,058 | 2,020,000 | 1,171,901 | 2,952,000 | 173,290 | 73,428 | 74,235 |

| REQ./UNIT | | Feeder pigs 50-230 lbs. | Breeding sheep (per ewe) | Feeder lamb | Corn (100 bu./A) | Grain sorghum (100 bu./A) | Soybeans (34 bu./A) | Wheat (50 bu./A) |
|---|---|---|---|---|---|---|---|---|
| Capital Needed | C | 105.00 | 132.50 | 61.89 | 159.50 | 130.50 | 90.00 | 86.50 |
| Labor Required | D | .9 | 3 | .7 | 3.6 | 3.6 | 3.4 | 1.6 |
| Expected Net Return | E | 10.00 | 37.00 | 3.66 | 120.50 | 119.50 | 134.50 | 103.50 |

**REQ./ENTERPRISE**

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Size for Income | F | 2,000 | 541 | 5,464 | 166 | 167 | 149 | 193 |
| Labor (hours) | G | 1,800 | 1,623 | 3,824.8 | 597.6 | 601.2 | 506.6 | 308.8 |
| Total Capital | H | 210,000 | 71,682.50 | 338,166.96 | 26,477 | 21,793.50 | 13,410 | 16,694.50 |

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 3: Advantages of a Beef Enterprise

EVALUATION

**Read the paragraph and answer the questions that follow by circling the letter of the best answer.**

Mary Beefproducer is given an opportunity to enter the beef production industry on a particular tract of land in Missouri. This tract of land is 200 acres, and half of it is a hilly, rocky area that is not suitable for crop production. The other half would be suitable for average crop production. The surrounding farms have good crop land, and obtaining grain for feed would be easy. Mary wants a program that has a short investment period and can provide a moderate amount of labor. There are facilities on the land that could be adapted for working and treating animals, and there is plenty of feed storage. Mary is prepared for a large investment.

1. Mary's situation is best suited for which kind of beef enterprise?

   a. Cow-calf
   b. Backgrounding or stocker
   c. Deferred finishing
   d. Immediate finishing

2. Mary can rent this land for $40 per acre, but she would have to borrow the money for rent at 12% interest. What would be the total land expense for a year's rent?

   a. $960
   b. $8,024
   c. $8,480
   d. $8,960

3. She can also buy the land at $200 per acre at 12% interest with a principal payment of $2,000 per year. What will be the land expense per year when buying the land?

   a. $2,440
   b. $2,800
   c. $4,800
   d. $6,800

4. (Renting, Buying) would show less expense on the cash flow.

5. If Mary would put the tillable acres in row crops, what kind of beef enterprise would she have?

   a. Companion
   b. Full-time
   c. Part-time with off-farm work
   d. Retirement

# Enterprise Chart

| REQ./UNIT | | Beef Cow, spring calf | Background calf through summer | Deferred finish calf | Immediate finish calf | Dairy (12,500 lbs. milk/cow) | Sow and 12 market hogs | Sow and 12 65-lb. feeder pigs |
|---|---|---|---|---|---|---|---|---|
| Capital Needed | C | 703.00 | 505.00 | 703.00 | 738.00 | 2,666.00 | 1,266.00 | 707.00 |
| Labor Required | D | 6 | 1 | 5 | 3 | 50 | 28 | 20 |
| Extended Net Return | E | 70.00 | 5.00 | 12.00 | 5.00 | 310.00 | 346.00 | 190.00 |
| **REQ./ENTERPRISE** | | | | | | | | |
| Size for Income | F | 286 | 4,000 | 1,667 | 4,000 | 65 | 58 | 105 |
| Labor (hours) | G | 1,716 | 4,000 | 8,335 | 12,000 | 3,250 | 1,624 | 2,100 |
| Total Capital | H | 201,058 | 2,020,000 | 1,171,901 | 2,952,000 | 173,290 | 73,428 | 74,235 |

| REQ./UNIT | | Feeder pigs 50-230 lbs. | Breeding sheep (per ewe) | Feeder lamb | Corn (100 bu./A) | Grain sorghum (100 bu./A) | Soybeans (34 bu./A) | Wheat (50 bu./A) |
|---|---|---|---|---|---|---|---|---|
| Capital Needed | C | 105.00 | 132.50 | 61.89 | 159.50 | 130.50 | 90.00 | 86.50 |
| Labor Required | D | .9 | 3 | .7 | 3.6 | 3.6 | 3.4 | 1.6 |
| Expected Net Return | E | 10.00 | 37.00 | 3.66 | 120.50 | 119.50 | 134.50 | 103.50 |
| **REQ./ENTERPRISE** | | | | | | | | |
| Size for Income | F | 2,000 | 541 | 5,464 | 166 | 167 | 149 | 193 |
| Labor (hours) | G | 1,800 | 1,623 | 3,824.8 | 597.6 | 601.2 | 506.6 | 308.8 |
| Total Capital | H | 210,000 | 71,682.50 | 338,166.96 | 26,477 | 21,793.50 | 13,410 | 16,694.50 |

## COMPARING ENTERPRISES

A. What is the yearly income needed from a full-time enterprise?

$_____

| | | | | |
|---|---|---|---|---|
| B. Enterprises to be compared | _____ | _____ | _____ | _____ |
| **Requirements/Unit** | | | | |
| C. Capital needed | $_____ | $_____ | $_____ | $_____ |
| D. Labor required | _____hrs | _____hrs | _____hrs | _____hrs |
| E. Expected net return | $_____ | $_____ | $_____ | $_____ |
| **Requirements/Enterprise** | | | | |
| F. Size for income A : E | _____ | _____ | _____ | _____ |
| G. Labor (hours) D x F | _____ | _____ | _____ | _____ |
| H. Total capital C x F | _____ | _____ | _____ | _____ |

## ENTERPRISE ESTIMATES
**(per unit)**

| Enterprise | Capital | Labor (hrs) | Returns |
|---|---|---|---|
| Beef cow, spring calf | $ 703.00 | 6 | $ 70.00 |
| Background calf through summer | 505.00 | 1 | 5.00 |
| Deferred finishing calf | 703.00 | 5 | 12.00 |
| Immediate finish calf | 738.00 | 3 | 5.00 |
| Dairy (12,500 lbs. milk/cow) | 2,666.00 | 50 | 310.00 |
| Sow and 12 market hogs | 1,266.00 | 28 | 346.00 |
| Sow and 12 65-lb. feeder pigs | 707.00 | 20 | 190.00 |
| Feeder pigs, 50-230 lbs. | 105.00 | .9 | 10.00 |
| Breeding sheep (per ewe) | 132.50 | 3 | 37.00 |
| Feeder lamb | 61.89 | .7 | 3.66 |
| Corn (100 bu./A) | 159.50 | 3.6 | 120.50 |
| Grain sorghum (100 bu./A) | 130.50 | 3.6 | 119.50 |
| Soybeans (34 bu./A) | 90.00 | 3.4 | 134.50 |
| Wheat (50 bu./A) | 86.50 | 1.6 | 103.50 |

Credit: Missouri Farm Planning Handbook (Manual 75). Columbia: UMC College of Agriculture and Extension Division, 1983.

UNIT - ADVANCED BEEF

Lesson 4: Types of Markets

Objective: The student will be able to evaluate the major types of beef markets available.

Study Questions

1. **What are some local and regional markets for cattle?**
2. **What are the advantages and disadvantages of a graded cattle market?**
3. **How do national and international factors affect local markets?**
4. **What is a video auction and what is its purpose?**

References


1. Gillespie, James R. Modern Livestock and Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 17: Marketing Beef
2. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.
3. Handout
   a) HO 4.1: Marketing Beef Cattle

UNIT - ADVANCED BEEF PRODUCTION

Lesson 4: Types of Markets

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

The beef producer has worked hard and has raised a small herd of cattle that is ready for market. To make money on these animals they must be sold. How or where can the animals be marketed to receive the best profits possible?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students where they could sell their cattle. Point out facts in each market that affect the price received for the cattle.

**What are some local and regional markets for cattle?**

a) Terminal markets (central markets or public stockyards)
   1) Fees deducted from the cattle's selling price
      (a) Yardage: fee charged for the use of the stockyard facilities
      (b) Commission: fee charged by the commission firm or selling agent for the function of bargaining with purchaser representatives for the best possible price for the cattle
      (c) Feed costs: feed given to the cattle while in the stockyard
      (d) Insurance
   2) Location
      (a) Terminal markets for feeder cattle are in the western or midwestern states.
      (b) Terminal markets for slaughter cattle tend to be near population centers and packing plants.

b) Auction markets (local sale barns or community auctions)
   1) Cattle are sold by public bidding, with the animals going to the highest bidder.
   2) Auction markets are popular because of their convenience for buyers and the open competition for cattle.
   3) The markets are of most value to the smaller cattle producer.

4) Charges are a percentage of the selling price or a fixed fee paid by the seller.
   (a) Yardage
   (b) Feed
   (c) Insurance
   (d) Brand and health inspection
5) Auction markets sell both feeder and slaughter cattle.

c) Direct sales
   1) Contract sales
      (a) Cattle from feeder cattle producers are sold directly to cattle feeders.
      (b) Sale is made where the cattle are produced.
   2) Cattle dealers
      (a) Cattle are bought for cattle feeders.
      (b) A cattle buyer is paid by commission or through buying the cattle outright and then reselling them at a higher price.
   3) Order buyers
      (a) They buy feeder cattle on order for cattle feeders.
      (b) They buy slaughter cattle on order for packing plants.
   4) Packing plants
      (a) Price is determined after the animal is slaughtered.
      (b) Price is determined by carcass weight and grade.

2. Ask the students if any of them have been involved with a graded feeder calf auction. If there are some who have, ask them how the cattle were grouped for sale. After determining how the sale works, have the students discuss the advantages and disadvantages to this type of marketing. Then look at selling slaughter animals through grade and yield. A quick review of carcass yield and quality grades may be necessary for the students to find advantages to selling by grade and yield. Have the students discuss when this is--and is not--profitable.

**What are the advantages and disadvantages of a graded cattle market?**

a) Graded feeder cattle auction
   1) Advantages
      (a) Since cattle are sorted by grade, not producer, the small operator reaps the same prices as the large operator.
      (b) Cattle feeders are given an opportunity to purchase feeder calves of specified quality and quantity, while saving the time and expense of shopping around.
   2) Disadvantages
      (a) If the auction has a small number of total cattle to offer for sale, buyers may not be attracted.
      (b) Too few buyers for the head of cattle at the auction can lead to lower prices.
      (c) Buyers like to purchase truckloads of a single

quality grade, and a small number of quality grade may cause a lower price for the cattle.

b) Selling slaughter cattle by yield and grade
   1) Advantages
      (a) When producing quality animals that have a high percentage of lean cuts naturally
      (b) When specially feeding cattle to produce higher than normal amounts of lean cuts
   2) Disadvantages
      (a) Markets are usually located near population centers.
      (b) Auction prices may equal carcass prices when the dressing percentage is considered.

3. Using HO 4.1, discuss with the students the national and international factors that affect prices. Ask them how these factors could affect local markets. It may help to apply these factors to the laws of supply and demand.

**How do national and international factors affect local markets?**

a) Increase prices
   1) Exports
   2) Small numbers of cattle produced
   3) Increased consumer demand
   4) Increased use of wheat pasture
   5) Restocking after drought conditions
   6) Abundance of grain (low grain prices)
   7) Other factors

b) Decrease prices
   1) Imports
   2) Embargoes
   3) Large numbers of cattle produced
   4) Decreased consumer demand
   5) Drought (decreased feed availability)
   6) Other factors

4. Ask if any of the students have attended a video auction. Discuss what a video auction is and how it is used.

**What is a video auction and what is its purpose?**

a) Procedure
   1) Buyers are shown a 2-4 minute videotape of the cattle offered for sale.
      (a) Visual portion of tape shows the cattle at the seller's farm or ranch.
      (b) Audio portion of tape describes weight, weighing location, cattle location, background information and various delivery date options.
   2) An auctioneer sells the cattle to the highest bidder.
   3) Buyer and seller arrange for shipping.

b) Purpose
   1) The producer can set the sale conditions.
   2) Cattle can be observed in their original situations.
   3) Cattle can remain in one location until after they are sold, reducing stress.

F. Other activities

1. A trip to a local livestock market would make a good field trip.

2. A visit by an order buyer to answer student questions may also help.

3. Subscribe to the USDA's Market News Summaries (daily or weekly) or the Drover's Journal magazine to explore the worth of cattle. (Courtesy classroom copies of the Drover's Journal may be obtained. See the references listing in the introduction for more information.)

G. Conclusion

There are many people and factors that influence the price of cattle that the local producer receives.

H. Competency

Evaluate the major types of beef markets available.

I. Answers to Evaluation

1. b
2. b
3. c
4. d
5. a
6. c
7. increase
8. decrease
9. decrease
10. decreased
11. increase
12. increase

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 4: Types of Markets

EVALUATION

**Multiple choice: circle the letter of the most correct answer.**

1. What is a written agreement between a buyer and seller to market cattle?

   a. Auction
   b. Contract sale
   c. Sale catalog
   d. Trade

2. Who buys cattle to speculate on the market?

   a. Auctioneer
   b. Cattle dealer
   c. Order buyer
   d. Packing plant

3. Who buys cattle for other people?

   a. Auctioneer
   b. Cattle dealer
   c. Order buyer
   d. Packing plant

4. Who buys cattle for direct slaughter on grade and yield?

   a. Auctioneer
   b. Cattle dealer
   c. Order buyer
   d. Packing plant

5. What are the three major ways to market cattle?

   a. Direct sales, auction markets, terminal markets
   b. Auction markets, order buyers, contract sales
   c. Terminal markets, contract sales, order buyers
   d. Direct sales, contract sales, cattle dealers

6. Which is <u>not</u> a kind of information that should be included on a tape's audio portion for a video auction?

   a. Weight
   b. Weighing location
   c. Cattle destination
   d. Delivery date options

**Circle the most correct answer.**

7. Exports (increase, decrease) beef prices.

8. Trade embargoes may (increase, decrease) beef prices.

9. Prices will usually (increase, decrease) during a drought.

10. Prices are (increased, decreased) by fewer consumers buying beef.

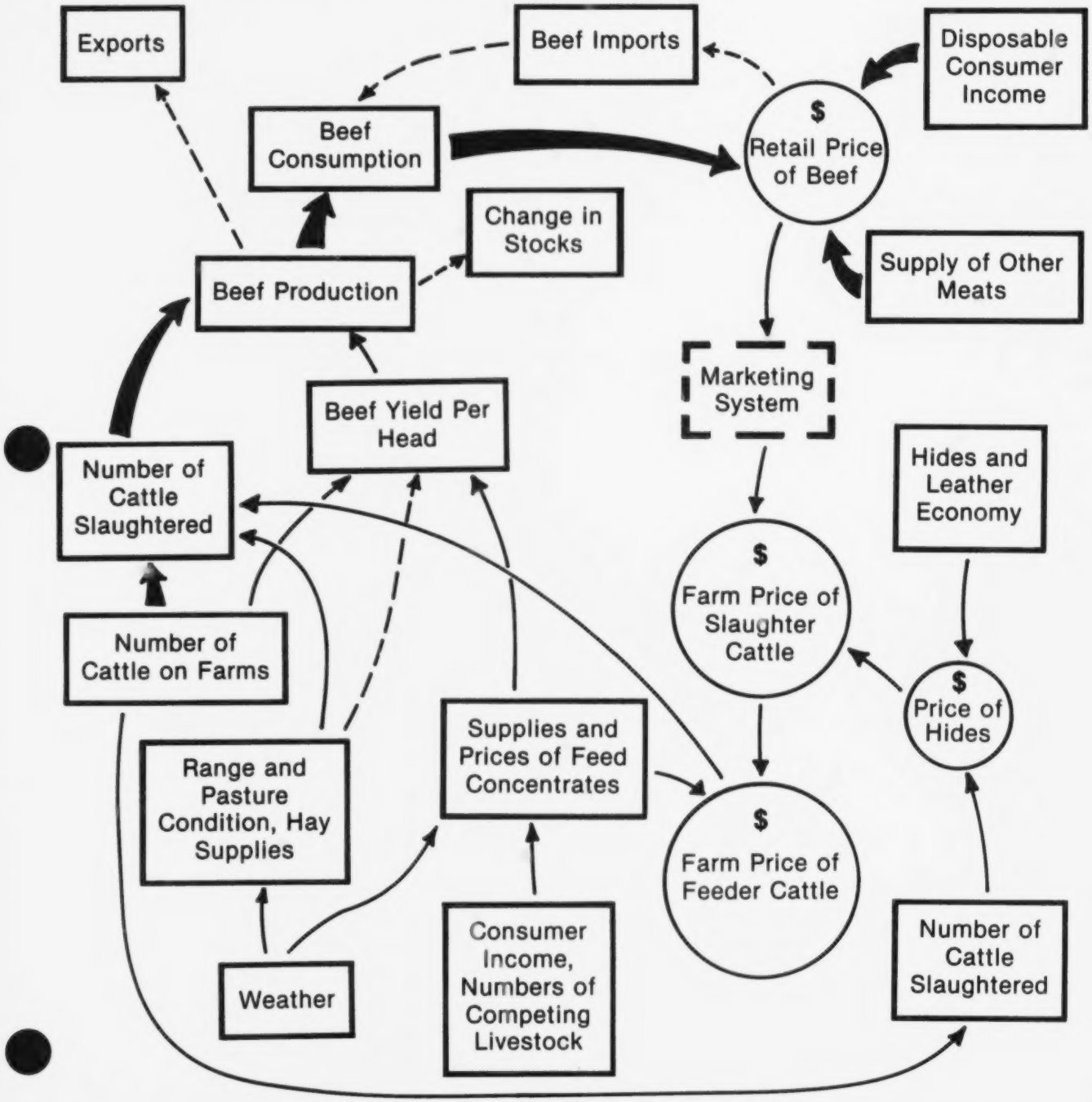
11. Prices may (increase, decrease) during the restocking period after a drought.

12. If fewer cattle are produced, the price of cattle should (increase, decrease).

# Marketing Beef Cattle

## The Demand and Supply Structure for Beef

Arrows show direction of influence. Heavy arrows indicate major paths of influence; light, solid arrows indicate less important factors of influence, while dashed arrows are pathways of minor influence.




**Credit:** Adapted from Robert E. Taylor's *Beef Production and the Beef Industry: A Beef Producer's Perspective.* Minneapolis, Minn.: Burgess, 1984.

UNIT - ADVANCED BEEF

Lesson 5: Marketing Options

Objective: The student will describe the marketing options available for beef cattle.

Study Questions

1. **How does the futures market affect the live cattle market?**
2. **Why and how is the beef industry changing to reflect consumer demands?**
3. **What marketing and promotional strategies can be utilized by seed-stock breeders?**
4. **What factors affect beef prices?**
5. **What alternatives can be used to obtain the best prices for feeder cattle?**

References


1. Gillespie, James R. Modern Livestock and Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 17: Marketing Beef
2. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

UNIT - ADVANCED BEEF

Lesson 5: Marketing Options

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

The beef producer from the last lesson has evaluated markets for the best prices offered now. How can the prices be improved? How can this herd be made "special" for better returns?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students where futures and cash prices are set. Then discuss the determination of each of these prices.

**How does the futures market affect the live cattle market?**

a) The futures market can give the expected price at slaughter weight to a cattle feeder when purchasing feeders.
   1) An estimate of cash prices
   2) Set selling prices with hedging
b) Cash prices may be affected by the need for cattle to fill futures contracts.
c) Grain futures market prices can affect cash prices because of the influence on production costs.

2. Ask the student who the beef is raised for. Discuss with the students how consumers express their acceptance of a product. Ask the students what has been done or could be done to meet the consumer's demand.

**Why and how is the beef industry changing to reflect consumer demands?**

a) Consumers are the ultimate market for the beef industry through their shopping attitudes.
   1) Health-oriented shoppers (17%): purchases decided by health-related issues
   2) Active lifestyle shoppers (16%): purchases decided by speed and preparation ease

3) Price-driven shoppers (25%): purchases decided by price of product
4) Creative cooks (20%): purchases decided by nutritional level
5) Meat lovers (22%): purchases decided by preference to the product

b) Producers need to provide a product that is acceptable to the consumer.
1) Offer quality products.
(a) Lean beef
(b) Well-defined quality grades
(c) Name brand beef
(d) Careful use of medicine and chemicals
2) Educate the consumer.
(a) Labeling
(b) Branding
(c) Advertising
3) Accommodate the consumer's lifestyle.
(a) Package for small meals of one or two portions.
(b) Provide products with quick preparation times.
(c) Provide products at reasonable prices.

3. Discuss with the students how purebred producers promote their livestock to the public.

**What marketing and promotional strategies can be utilized by seedstock breeders?**

a) Advertising
1) National breed publications
2) State breed association magazines or newsletters
3) General farm and ranch magazines
4) Local newspapers
5) Local radio stations
6) Farm signs
7) Personal letters accompanied by sale bills
(a) Previous buyers
(b) Likely buyers

b) Participation
1) Shows
2) Performance tests
3) Breed sire summaries
4) Central bull testing stations

4. Ask the students what types of cattle are desired for efficient processing. Discuss the normal pricing trends for beef.

**What factors affect beef prices?**

a) Packer preferences
1) Size of carcass
(a) Carcass weighs 600-800 pounds.

(b) Larger carcasses won't fit in boxes made for semi-trailers.
(c) Smaller carcasses do not make efficient use of space for boxed beef.
(d) Small carcasses cost the same to process as large ones but result in less retail meat.

2) Lean carcass for reduced trimming

b) Pricing trends

1) Seasonal trends
(a) Highs during April or May
(b) Lows in September, November or December
(c) Follow a uniform pattern that repeats itself from year to year
(d) Result from biological factors and management practices
(e) Affected by consumer and packer demand

2) Long-term trends
(a) Number of cattle raised
(b) Disposable income of consumers
(c) Cost of feed
(d) Supply of other meats

5. Ask the students what sized feeder cattle bring the highest prices in the area. Then ask them what else can be done to increase the value of these cattle.

**What alternatives can be used to obtain the best prices for feeder cattle?**

a) Marketing alternatives

1) Feeder calves
(a) Calves born in the spring are sold in the fall.
(b) Calves weigh about 400-500 pounds at market.

2) Yearlings
(a) Cattle are grown to 650-750 pounds.
(b) Cattle are fed mostly roughages.

b) Pre-conditioning

1) Advantages
(a) Prepares cattle for movement into a feedlot
(b) Reduces losses from sickness and death
(c) May increase price if accompanied by a certificate

2) Disadvantages
(a) May increase production cost
(b) Considered less important than general good management practices

c) Backgrounding

1) A growing and feeding period from weaning until entering the feedlot
2) Primarily utilizes roughage rations
3) Feeding period of 120-150 days
4) Calves not allowed to become too fat

F. Other activities

1. Invite a local beef producer to discuss trends of the industry or futures pricing.

2. Have the students make a collection of marketing types and promotional strategies.

G. Conclusion

The beef industry can realize more profits in some instances through better marketing and promotions for buyers and consumers.

H. Competency

Describe the marketing options available for beef.

I. Answers to Evaluation

1. c
2. a
3. b
4. f
5. e
6. a
7. b
8. d
9. d
10. d

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 5: Marketing Options

EVALUATION

**Match the types of consumers on the right with the factors they use to make their food purchases on the left.**

1. ____ Health-related issues
2. ____ Speed and preparation ease
3. ____ Nutritional level
4. ____ Price of product
5. ____ Preference to the product

a. Active lifestyle
b. Creative cooks
c. Health-oriented
d. Lazy cooks
e. Meat lovers
f. Price-driven

6. What sized beef carcass does the packer prefer for efficient slaughtering and boxed beef considerations?

   a. 600-800 pounds
   b. 900-1000 pounds
   c. 1000-1200 pounds
   d. 1100-1300 pounds

7. During which months should a beef producer try to market livestock to obtain the seasonal high prices?

   a. January or February
   b. April or May
   c. June or July
   d. October or November

8. In what two ways does the futures market affect buyers in the live beef market?

   a. To advertize livestock and guarantee profits
   b. To advertize livestock and set selling prices
   c. To set cash prices in the futures and guarantee profits
   d. To estimate cash prices in the future and set selling prices

9. Which of the following is a procedure that prepares feeder cattle to enter the feedlot?

   a. Weaning
   b. Vaccinating
   c. Backgrounding
   d. Preconditioning

10. Which of the following is a method of evaluating a seedstock producer's bulls in performance with other producers?

   a. Shows
   b. Performance test
   c. Breed sire summaries
   d. Central testing stations

UNIT - ADVANCED BEEF

Lesson 6: Production Strategies

Objective: The student will identify production strategies that fulfill a chosen beef marketing strategy.

Study Questions

1. **What are the considerations for selecting calves or yearlings for the feedlot?**

2. **What are the advantages and disadvantages of feeding cycling heifers, spayed heifers, steers or bulls in the feedlot?**

3. **What are the advantages and disadvantages of using implants and/or medicated feed?**

4. **What are the advantages and disadvantages of retained ownership?**

References

1. Gillespie, James R. Modern Livestock and Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 14: Feeding and Management of Feeder Cattle

2. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

UNIT - ADVANCED BEEF

Lesson 6: Production Strategies

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Carl Cattlefinisher has a feedlot for finishing cattle. He wants to receive as large an income as possible while considering efficiency and profits. What are his production considerations?

C. Assignment

D. Supervised study

E. Discussion

1. In the previous lesson, students determined the considerations for feeding goals. Now ask the students how age affects cattle performance in the feedlot.

**What are the considerations for selecting calves or yearlings for the feedlot?**

a) Calves
   1) Make more efficient gains than older cattle
   2) Adaptable to many feeding systems
   3) Require longer feeding periods
   4) Require higher quality feeds
   5) Tend to have higher death losses and medical costs
   6) Lightweight at purchase because of condition or frame
      (a) Cost of gain
      (b) Buying price

b) Yearlings
   1) Tend to have fewer health problems
   2) Go on feed and finish faster
   3) Limited flexibility in feeding program
   4) Require large amounts of roughages, some of which may be of a lower quality.

2. Discuss with the students how the feeders' sex may require special management practices.

**What are the advantages and disadvantages of feeding cycling heifers, spayed heifers, steers or bulls in the feedlot?**

a) Heifers
   1) Advantages
      (a) Often underpriced in comparison to steers
      (b) Finish more quickly than steers
   2) Disadvantages
      (a) Sell for less than steers at slaughter due to packer reservations about pregnancy
      (b) Finish at lower weights
      (c) Slower rate-of-gain
      (d) Poor performance and reduced slaughter price if pregnant
      (e) Lower quality and dressing percentage

b) Spayed heifers
   1) Advantages
      (a) No problems associated with pregnancy
      (b) Adaptable to more management systems
      (c) Respond well to growth promoters, except for MGA
   2) Disadvantages
      (a) Slower rate-of-gain than intact heifers
      (b) Less efficient than intact heifers
      (c) Spaying cost
      (d) Infection risk

c) Steers
   1) Advantages
      (a) 10-15% faster rate-of-gain than cycling heifers
      (b) 10-15% better feed efficiency than cycling heifers
   2) Disadvantage: less feed efficiency than bulls

d) Bulls
   1) Advantages
      (a) Faster rate-of-gain than steers
      (b) More efficient than steers
   2) Disadvantage: little acceptance in the marketplace

3. Ask the students how they can influence the meat production in feedlot cattle. Discuss the consequences of these actions.

**What are the advantages and disadvantages of using implants and/or medicated feed?**

a) Implants
   1) Advantages
      (a) Improved weaning weights by 10-35 pounds
      (b) Increased rate-of-gain by 8-10%
      (c) Improved feed efficiency by 6-10%
   2) Disadvantages
      (a) Withdrawal period for some brands
      (b) Size requirements with some brands

b) Feed additives

1) MGA (Melengestrol acetate)
   (a) Advantages
      (1) Improved rate-of-gain
      (2) Improved feed efficiency
      (3) Suppressed heat in heifers
   (b) Disadvantages
      (1) A 48-hour withdrawal before slaughter is required.
      (2) A 72-hour withdrawal will cause some heifers to come in heat.
      (3) MGA is not effective for steers, spayed heifers or pregnant heifers.
2) Inophores (like Rumensin$^{R}$ and Bovatec$^{R}$)
   (a) Advantages
      (1) Improved efficiency of rumen fermentation
      (2) Reduced energy losses associated with volatile fatty acid production in the rumen
      (3) Improved feed efficiency of high grain or high roughage rations
      (4) Increased rate of rate-of-gain with high roughage diets and somewhat better rate-of-gain with high grain rations
      (5) Some control of coccidiosis and bloat
   (b) Disadvantages
      (1) Increased rate-of-gain may be offset by reduced intake on high grain rations.
      (2) Rumensin$^{R}$ is toxic to horses and may be to swine.
      (3) Bovatec$^{R}$ has not been approved for replacements or cattle on pasture.
      (4) Bovatec$^{R}$ has not been cleared for use with antibiotics.
3) Antibiotics
   (a) Advantages
      (1) Reduced rumen parakeratosis and liver abscesses
      (2) Improved general health
      (3) Improved absorption of nutrients
      (4) Best results in stressed animals
   (b) Disadvantages
      (1) Withdrawal times
      (2) Possible development of drug-resistant strains of harmful microorganisms
4) Buffers
   (a) Advantages
      (1) Improved feed intake
      (2) Improved daily gain
      (3) Improved feed efficiency
   (b) Disadvantage: no guarantee of results

4. If money can be made by finishing cattle, ask the students if the cow-calf producer should integrate these operations.

**What are the advantages and disadvantages of retained ownership?**

a) Advantages
   1) Allows utilization of genetically superior cattle
   2) Spreads the high investment and operating costs over more pounds of calves produced
   3) More stable slaughter cattle prices than feeder calf prices
   4) Reduced stress on the cattle if kept on the same farm
   5) Custom feedlots
      (a) Allow cattle producers ownership through the feeding phase
      (b) Less expense for cattle for feedlot operator
      (c) Less facilities expense for producer

b) Disadvantages
   1) Slower returns
   2) More health risks
   3) Income tax problems when starting program
   4) Higher operating capital requirement

F. Other activities

1. A field trip to a feedlot operation

2. A visit from a feedlot operator or manager

G. Conclusion

The feedlot operator must analyze production strategies to achieve a combination of profits, efficiency and rate-of-gains.

H. Competency

Identify production strategies that will fulfill the chosen beef marketing strategy.

I. Answers to Evaluation

1. a
2. c
3. c
4. d
5. c
6. a
7. d
8. b
9. d
10. d

Name_____

UNIT - ADVANCED BEEF

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Lesson 6: Production Strategies

EVALUATION

**Multiple choice: circle the most correct answer.**

1. Which of the following is an advantage of using MGA?

   a. Heat can be suppressed in heifers.
   b. Before slaughter, a 48-hour withdrawal is required.
   c. A 72-hour withdrawal will cause some heifers to come in heat.
   d. MGA is not effective for steers, spayed heifers or pregnant heifers.

2. Which of the following is a disadvantage of using inophores?

   a. Some control of coccidiosis and bloat
   b. Improved efficiency of rumen fermentation
   c. Increased rate-of-gain sometimes offset by reduced intake on high grain rations
   d. Reduced energy losses associated with volatile fatty acid production in the rumen

3. Which of the following is true for selecting calves for the feedlot?

   a. Go on feed and finish faster
   b. Tend to have the fewest health problems
   c. Make more efficient gains than older cattle
   d. Require low-quality feed with a large amount of roughage

4. Which of the following is true for feeding cycling heifers in the feedlot?

   a. They achieve a fast rate-of-gain.
   b. They sell for more than steers at slaughter.
   c. There are few problems with pregnancy.
   d. They finish more quickly than steers.

5. Which of the following is true for feeding spayed heifers in the feedlot?

   a. They achieve a fast rate-of-gain.
   b. They are more efficient than intact heifers.
   c. They have no problems associated with pregnancy.
   d. They respond well to the feed additive MGA.

6. Which of the following is true for feeding bulls in the feedlot?

   a. They show more feed efficiency than steers.
   b. They enjoy a good acceptance in the marketplace.
   c. They have a slower rate-of-gain than steers.
   d. They respond well to the feed additive MGA.

7. Which of the following is not a feed additive?

   a. MGA
   b. Inophores
   c. Antibiotics
   d. Implants

8. Which of the following is a disadvantage of retained ownership?

   a. Allows utilization of genetically superior cattle
   b. Slower returns
   c. Spreads the high investment and operating cost over more pounds of calves produced
   d. Slaughter cattle prices usually more stable than feeder calf prices

9. Which of the following is <u>not</u> an advantage of custom feeding?

   a. Allows cattle producers ownership through the feeding phase
   b. Requires less cattle expense for feedlot operator
   c. Requires less facility expense for the producer
   d. Assumes little health risk for the cattle

10. Which feed additive may be most effective with stressed cattle?

   a. MGA
   b. Buffers
   c. Inophores
   d. Antibiotics

UNIT - ADVANCED BEEF

Lesson 7: Local, State and Federal Regulations

Objective: The student will identify local, state and federal regulations as they apply to beef production.

Study Questions

1. **What are the government health regulations that affect the beef industry?**

2. **How do health regulations influence production strategies and related management activities?**

3. **What environmental protection regulations affect beef production?**

References

1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

UNIT - ADVANCED BEEF

Lesson 7: Local, State and Federal Regulations

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Chris Cattlemen has recently become involved in a local beef promotional campaign. Part of the promotional materials explain that beef is a healthy part of a nutritious diet. Chris wants to know how this claim can be made with all the chemicals used around a farm. What regulations help guarantee that beef is nutritious and safe for consumption?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students to discuss the reasons for making rules and regulations. Who regulates the ingredients that may be added to food? Compare the cow to a food product in a store and the farmer to the manufacturer. Ask the students to explain how regulations affect beef production.

   **What are the government health regulations that affect the beef industry?**

   a) The purpose of health regulations is to provide quality, nutritious beef.
   b) Regulations affect beef from the producer to the consumer.
      1) Control and eradication of animal disease
      2) Control of residues in meat
      3) Ensure sanitary slaughtering and processing practices

2. Ask the students how regulations affect beef production. Discuss how and why these regulations were developed.

   **How do health regulations influence production strategies and related management activities?**

   a) Chemicals used in beef enterprises regulated by the FDA
      1) Approval of chemicals and additives
      2) Control of dosages and withdrawal periods which can be found on product labels
      3) Substances included

(a) Hormones
(b) Pesticides
(c) Antibiotics
(d) Other drugs

b) Animal disease control regulated by the USDA
   1) Goal: healthy animals for slaughter
   2) Avoids epidemics that would reduce beef supply
   3) Actions that can be taken
      (a) Regulation of interstate cattle movement
      (b) Quarantines
      (c) Immunization programs
      (d) Indemnities paid for destroyed animals
      (e) Penalties for violation of regulations

c) Meat inspection
   1) Veterinarian's inspection of live cattle before slaughter
   2) Carcass, viscera inspection during slaughter
   3) Inspection of slaughter facilities

3. Ask the students how a beef enterprise can affect the environment. Discuss local cases where producers have had legal problems stemming from their operations. Explain that regulations vary from case to case, county to county, etc.

**What environmental protection regulations affect beef production?**

a) Federal and state environmental protection agencies administer environmental regulations.
b) Regulations referring to water and air pollution are collectively called nuisance laws.
c) Violations can result in a nuisance lawsuit ending in three possible ways.
   1) An injunction
   2) Damage charges
      (a) Actual: for monetary and property losses
      (b) Punitive: for the defendant's conduct
   3) Both an injunction and damage charges
d) Four types of nuisances may occur.
   1) Public nuisances interfere with the rights of a substantial number of people.
   2) Private nuisances interfere with the rights of a few people.
   3) Permanent nuisances cannot be controlled or limited with corrective measures.
   4) Temporary nuisances can be controlled or limited with corrective measures.
e) Steps can be taken to avoid lawsuits
   1) Operations should be established in agriculturally zoned areas.
   2) Locate the operation away from neighbors' homes.
   3) Initiate an operation in an unoccupied area to help avoid lawsuits with future neighbors.

4) Use adequate waste treatment facilities.
5) Maintain the facilities.

F. Other activities

G. Conclusion

Regulations are enacted to protect the rights and health of the general public. These regulations affect the selection and timing of compounds used in beef production.

H. Competency

Identify local, state and federal regulations as they apply to beef production.

I. Answers to Evaluation

1. d
2. a
3. b
4. c
5. a
6. d

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 7: Local, State and Federal Regulations

EVALUATION

**Multiple choice**

1. What kind of nuisances can be controlled or limited with corrective measures?

   a. Permanent nuisances
   b. Private nuisances
   c. Public nuisances
   d. Temporary nuisances

2. What nuisances cannot be controlled or limited by corrective measures?

   a. Permanent nuisances
   b. Private nuisances
   c. Public nuisances
   d. Temporary nuisances

3. What kind of nuisances interfere with the rights of a few people?

   a. Permanent nuisances
   b. Private nuisances
   c. Public nuisances
   d. Temporary nuisances

4. What nuisances interfere with the rights of a substantial number of people?

   a. Permanent nuisances
   b. Private nuisances
   c. Public nuisances
   d. Temporary nuisances

5. What type of damages may be awarded for expenses and property losses?

   a. Actual
   b. Indemnity
   c. Injunction
   d. Punitive

6. What type of damages are granted for the defendant's conduct?

a. Actual
b. Indemnity
c. Injunction
d. Punitive

UNIT - ADVANCED BEEF

Lesson 8: Governmental Programs

Objective: The student will be able to describe government programs and how they affect the beef industry.

Study Questions

1. **How has the U.S. government become involved in the beef industry?**

2. **Where can information on government beef programs be located?**

References

1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

UNIT - ADVANCED BEEF

Lesson 8: Governmental Programs

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Carrie Curious is trying to develop a sound reputation for her marketing of wholesome, quality beef. Carrie knows that if her herd is quarantined or if she sells condemned beef, this reputation could be destroyed. She would also like to avoid the fines associated with beef regulation disobedience. What government regulations affect the beef industry, and where can Carrie gather information on these regulations?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students why the government develops laws, rules and regulations for the beef industry. Discuss the resulting legislation and agencies that affect the beef producer.

**How has the U.S. government become involved in the beef industry?**

a) Federal Meat Inspection Act
   1) Legislation
      (a) The law was first enacted in 1890 to assure that exported meat was disease-free.
      (b) In 1891 and 1895, inspection of live animals before slaughter was added to the meat inspection.
      (c) The Meat Inspection Act of 1906 included antemortem (live) and postmortem inspection with other features that are still in effect today.
      (d) The Federal Meat Inspection Act of 1967 (Wholesome Meat Act) brought all processors under a uniform meat inspection service and specified that states enact at least equal legislation.
   2) Intent of legislation
      (a) Assure sanitary slaughtering
      (b) Prevent use of harmful additives
      (c) Make false and misleading labeling illegal

3) Results
   (a) Antemortem (live) inspection of cattle by a veterinarian
   (b) Carcass and viscera inspection during slaughter
   (c) Imported fresh beef inspection
   (d) Annual foreign plant inspection
4) Administration
   (a) Inspections are performed by personnel of the USDA's Consumer and Marketing Service.
   (b) Inspection cost is borne by the federal government.
   (c) Cost-sharing arrangements are entered in states with their own inspection.

b) Packers and Stockyards Act
1) Background
   (a) Enacted in 1921 and last amended in 1958
   (b) Administered by the Department of Agriculture
2) Purpose: to prescribe rules of fair competition and fair trade practices for all firms or persons engaged in livestock marketing and trading in foreign or interstate commerce
3) Industry segment affected
   (a) Dealers
   (b) Stockyards
   (c) Auction markets
4) Marketing protection provided
   (a) Accurate weights
   (b) Protection of stockman's funds
   (c) Full and accurate accounting
   (d) Reasonable and adequate facilities at fair and nondiscriminatory rates
   (e) Sale of cattle under open, competitive conditions
5) Requirements under the act
   (a) Firms or dealers are required to post bond to ensure full payment for cattle sold.
   (b) Buyers and seller must be given a true, written account of any sale or purchase transaction.
6) Enforced by representatives of the Packers and Stockyards Administration

c) Food, Drug and Cosmetics Act
1) Legislation first passed in 1938
2) Began the Food and Drug Administration (FDA)
   (a) Administered through the Department of Health and Human Services
   (b) Function that affects cattlemen covers residues in carcasses and manure from feed additives, pesticides, antibiotics and other drugs

d) Animal Disease Control
1) Division of the Agricultural Research Service, USDA
2) Administers regulations relating to control and eradication of animal disease

(a) Matters on import and export trade of live cattle
(b) Inspection of meat inspection records
(c) Collection of reports from practicing veterinarians
(d) Quarantines imposed to prevent spread of communicable diseases

e) Beef Promotion and Research Act of 1985
1) Contained in the 1985 Farm Bill
2) $1 per head checkoff
(a) Funds for beef promotion, research, consumer information and industry information
(b) Collection of money by auction markets, inspectors, order buyers, dealers, brand inspectors, packers or other buyers each time cattle are sold
(c) Investors: all cattlemen, along with importers
(d) Overseen by a 113-member Cattlemen's Beef Promotion and Research Board
(e) Managed by a 20-member Operating Committee consisting of 10 board members and 10 Beef Industry Council directors
(f) Up to 50¢ per head retained by the qualified state beef council for in-state promotion or investment in national promotion
(g) Administration costs limited to 5% of collection
(h) Penalty for violation up to $5,000

2. Because of the many changes that are being made in governmental programs, ask the students where they can obtain information for compliance with these programs.

**Where can information on government beef programs be located?**

a) U.S. Department of Agriculture
b) Extension service
c) Veterinarians
d) Beef organizations and associations
e) Industry-related magazines
f) Market officials

F. Other activities

G. Conclusion

The government has become involved in the beef industry to ensure a quality product and to aid the producer in obtaining fair marketing.

H. Competency

Describe government programs and how they affect the beef industry.

I. Answers to Evaluation

| | | | | | |
|---|---|---|---|---|---|
| 1. | a | 6. | d | 11. | b |
| 2. | c | 7. | e | 12. | a |
| 3. | b | 8. | b | 13. | c |
| 4. | d | 9. | e | 14. | c |
| 5. | e | 10. | a | 15. | b |

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 8: Governmental Programs

EVALUATION

**Matching: Place the letter of the corresponding legislation with the descriptions that follow.**

a. Animal disease control laws
b. Beef Promotion and Research Act
c. Federal Meat Inspection Act
d. Food, Drug and Cosmetic Act
e. Packers and Stockyards Act

1. ____ Imposes quarantines
2. ____ Assures sanitary slaughtering
3. ____ Contained in the 1985 Farm Bill
4. ____ Regulates the allowable residues in carcasses and manures
5. ____ Requires an accurate account of all sales transactions
6. ____ Administered through the Department of Health and Human Services
7. ____ Prescribes rules of fair trade and fair trade practices
8. ____ Provides for the $1 checkoff per head on cattle sold
9. ____ Requires firms and dealers to post bond to ensure full payment for cattle sold
10. ____ Administers regulations relating to control and eradication of animal disease
11. ____ Proposed for beef promotion, research, consumer information and industry information
12. ____ Division of the Agricultural Research Service, U.S. Department of Agriculture
13. ____ Requires inspection of all beef animals to be slaughtered and sold
14. ____ Allows cost-sharing for states with their own inspections
15. ____ Managed by a 20-member Operating Committee consisting of 10 board members and 10 Beef Industry Council directors

UNIT - ADVANCED BEEF

Lesson 9: Associations and Organizations

Objective: The student will identify the different beef associations and organizations.

Study Questions

1. **What organizations and associations protect and may be utilized by the beef producer in Missouri?**

2. **What purposes do beef organizations and associations serve for the beef industry?**

References

1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

2. University of Missouri-Columbia Extension Division agricultural publications (optional)

   a) G10: Information on Missouri's Beef Cattle Industry (1984)
   b) G2906: Purebred Livestock Registry Associations (1985)

UNIT - ADVANCED BEEF

Lesson 9: Associations and Organizations

TEACHING PROCEDURES

A. Review

Review the previous lesson.

B. Motivation

Beef producer Fred Farmer has a friend, Sid Cityslicker, who wants to enter the beef industry. Sid knows there are several organizations and associations that aid the beef industry, but he would like to know what purposes they serve. Sid would also like to know more about the major beef organizations and associations and where information on the beef industry can be obtained. What should Fred tell Sid?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students to develop a list of organizations and associations which aid the beef producer.

**What organizations and associations protect and may be utilized by the beef producer in Missouri?**

a) University Extension
   1) Specialists
   2) Publications
b) Missouri Department of Agriculture
c) Missouri Conservation Commission
d) Missouri Cattlemen's Association
e) Midcontinent Farmers Association
f) Missouri Farm Bureau Federation
g) National Farmers Organization
h) Farmers Home Administration
i) Agricultural Stabilization and Conservation Service
j) Soil Conservation Service
k) Agricultural statisticians
l) Breed associations
m) Magazines
   1) Beef
   2) Feedlot Management
   3) Drovers Journal
   4) Missouri Beef Cattlemen
   5) Breed association publications

6) Missouri Ruralist
7) Today's Farmer

2. Discuss with the students the roles that associations and organizations in the previous question play. Why is it important that beef producers belong to county and state cattle associations? Emphasize that beef promotion and research are necessary if consumer demand for beef is to increase and new beef products are to be developed. What is the role of the beef breed associations? Refer students to the selected readings.

**What purposes do beef associations and organizations serve for the beef industry?**

a) To inform
   1) The public or consumers
   2) The producers
b) To promote beef products and beef herds
c) To regulate segments of the beef industry
d) To support beef research
e) To aid the beef industry in effective competition
f) To provide assistance
   1) Political influence in areas directly affecting beef
   2) Breed certifications
   3) Recordkeeping and analysis
   4) Performance evaluation

F. Other activities

1. Representatives from any of these associations and organizations could visit the class.

2. Ask students to collect information from an organization of their choice and to give reports on the organization they chose. For addresses, refer to sources such as the extension guides listed on the first page of this lesson.

G. Conclusion

The beef industry is provided many services by the associations and organizations that were organized for its support.

H. Competency

Identify the different beef associations and organizations.

I. Answers to Evaluation

1. c
2. b or d
3. d or a
4. a or b
5. c
6. b or d
7. a or c
8. So that **beef promotion** can increase demand and **research** can develop new products

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 9: Associations and Organizations

EVALUATION

**Match the association or organization on the right with a role it plays for beef producers on the left. NOTE: Although some may have more than one possibility, only one answer is required.**

1. ____ Promotes specific breeds of beef cattle
2. ____ Primarily promotes beef products and increases consumer awareness
3. ____ Conducts research to develop new beef products
4. ____ Conducts classes or meetings to update producers on the latest management practices
5. ____ Issues performance pedigrees and sire summaries
6. ____ Lobbies political leaders in areas affecting beef producers
7. ____ Assists producers in evaluating and collecting performance data on their herds

a. University of Missouri extension specialist

b. Missouri Cattlemen's Association

c. Purebred livestock registry association

d. Beef Industry Council

**Short answer**

8. Why is membership in at least one livestock organization or association important for beef producers?

UNIT - ADVANCED BEEF

Lesson 10: Breeding Stock Selection

Objective: The student will be able to select breeding stock that will increase the productivity of a beef herd.

Study Questions

1. **What methods should be used to select breeding stock?**
2. **What factors should be used to select replacement heifers?**
3. **How are performance records calculated?**
4. **What factors should be considered in selecting a bull?**
5. **What types of individual cow records should be kept?**

References


1. Gillespie, James R. Modern Livestock and Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 12: Selection and Judging of Beef
2. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.
3. Work Sheet
   a) WS 10.1: Evaluation Calculations

UNIT - ADVANCED BEEF

Lesson 10: Breeding Stock Selection

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Jane Herdsman has a cow-calf herd and would like to increase her production without increasing her cow herd. How can she select replacements to achieve her goal? What factors should she use in making culling decisions?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students how they can decide if a particular animal will improve the herd. Make a list of this information to use in determining methods of selecting herd replacements.

**What methods should be used to select breeding stock?**

a) Conformation, which refers to the appearance of the live animal
   1) Conformation includes the following factors.
      (a) Skeletal structure
      (b) Muscling
      (c) Fat balance
      (d) Straightness of the animal's lines
      (e) Structural soundness
      (f) Feminine or masculine characteristics
   2) A proper conformation will produce a maximum of high-priced cuts and a minimum of bone and internal organs.

b) Performance evaluation
   1) Production evaluation is a measure of a cow's production by the performance of its offspring.
   2) Progeny evaluation is the measure of a bull's production by the performance of its offspring.

c) Pedigrees may be used to possibly find recessive genes or to study the performance of those ancestors with performance pedigrees.

d) The records of collateral relatives may indicate performance potential.

2. Ask the students what factors they should consider when selecting replacement females for the improvement of their beef herds.

**What factors should be used to select replacement heifers?**

a) Breed (especially for crossbreeding enterprises)
b) Age of heifer for first calf
c) Heifer condition for breeding and milking ability
d) Structural soundness
e) Performance records
    1) Adjusted 205-day weights
    2) Weaning weight ratios
    3) Adjusted 365-day weights
    4) Yearling weight ratios
    5) Average daily gain
    6) Feed efficiency
f) Pedigree: recent relatives may indicate potential
g) Health
    1) Females should test negative for brucellosis, vibriosis and tuberculosis.
    2) Females should be free of any parasite problems.
h) Show winnings: may indicate ability to meet industry standards

3. Discuss with the students the following formulas and their importance. Be sure to discuss the fact that the animal's environment affects these figures; therefore, these records are best suited for animals raised under the same conditions. Use WS 10.1 to aid with this section.

**How are performance records calculated?**

a) Adjusted 205-day weight
    1) Formula:

$$\frac{\text{actual weaning wt. - birth wt.}}{\text{age in days}} \times 205 +$$

birth wt. + age-of-dam adjustment

    2) Age-of-dam adjustments for heifers
        (a) 2-year-old dam: add 54 pounds
        (b) 3-year-old dam: add 36 pounds
        (c) 4-year-old dam: add 18 pounds
        (d) 5- to 10-year-old dam: no adjustment
        (e) Dam more than 10 years old: add 18 pounds
    3) Indicates milking ability of the heifer and her dam
    4) Age-of-dam adjustments for bulls
        (a) 2-year-old dam: add 60 pounds
        (b) 3-year-old dam: add 40 pounds
        (c) 4-year-old dam: add 20 pounds
        (d) 5- to 10-year-old dam: no adjustment
        (e) Dam more than 10 years old: add 20 pounds
    5) Can indicate the milking ability of female offspring

b) Adjusted 205-day weight ratio
   1) Formula:

$$\frac{\text{adjusted 205-day wt. of individual}}{\text{ave. adjusted 205-day wt. of sex group}} \times 100$$

   2) Compares to other heifers in the herd
      (a) A ratio of greater than 100 is better than average.
      (b) A ratio of less than 100 is less than average.

c) Adjusted 365-day weight
   1) Formula:

$$\frac{\text{actual weight off test - weaning wt.}}{\text{days on test}} \times 160 +$$

   adjusted 205-day weight
   2) Indicates individual growth potential

d) Adjusted 365-day weight ratio
   1) Formula:

$$\frac{\text{adjusted 365-day wt. of individual}}{\text{ave. adjusted 365-day wt. of sex group}} \times 100$$

   2) Compares to other heifers on test

e) Average daily gain
   1) Formula: $\frac{\text{pounds gained}}{\text{days}}$
   2) Indicates an individual's rate of gain

f) Feed efficiency
   1) Formula: $\frac{\text{pounds of feed consumed}}{\text{pounds of gain}}$
   2) Indicates how well the animal converts feed to meat
   3) Indicates the cost of production

4. Ask the students what factors should be considered in selecting a herd bull and why the selection of a bull can have a large impact on herd quality.

**What factors should be considered in selecting a bull?**

a) Above-average adjusted weaning weights for the herd that season
b) Grade choice or above at weaning
c) Daily gain of 2.5 pounds after weaning
d) Adjusted yearling weight ratio of 100 or above
e) Large frame score (4-6) of offspring
f) Passing a recent semen test for fertility
g) Free of obvious physical and genetic conformation defects

5. Ask the students to list some reasons for culling cows. Then ask the students what records they should keep to determine what cows to cull.

**What types of individual cow records should be kept?**

a) Records on the cow
   1) Individual performance
   2) Health records

b) Management records
   1) Breeding ability
   2) Calving date
   3) Calving ease
   4) Disposition
   5) Condition

c) Records on the offspring
   1) Birth weights, if possible
   2) Weaning weights and ratios
   3) Yearling weights and ratios
   4) Any genetic defects
   5) Grade

F. Other activities

Have students select bulls from information presented in a sale catalog.

G. Conclusion

The selection of breeding stock is an important tool in increasing the value of the beef herd. Selection is one of the few methods available to control the genetics of a cow herd.

H. Competency

Select breeding stock that will increase the productivity of the beef herd.

I. Answers to Evaluation

1. b
2. c
3. g
4. h
5. c
6. a
7. b
8. f
9. e
10. d

J. Answers to work sheets

1. Work Sheet 10.1

   1. $\frac{520 - 70}{195} \times 205 + 70 + 60 = 603.1$

   2. $\frac{603}{550} \times 100 = 109$

3. $\frac{930 - 520}{165} \times 160 + 603 = 1,000.6$

4. $\frac{1,000.6}{925} \times 100 = 108.1$

5. $\frac{930 - 520}{165} = 2.48$

6. $\frac{3,690}{930 - 520} = 9.0$

UNIT - ADVANCED BEEF

Lesson 10: Breeding Stock Selection

**Circle the letter of the correct answ**

1. What does a proper conformation

   a. A maximum of high-priced
      organs
   b. A maximum of high-priced c
      organs
   c. A minimum of high-priced
      organs
   d. A minimum of high priced c
      organs.

2. What is cryptorchidism in a bull

   a. A bad disposition
   b. A type of veneral disease
   c. A condition where both test
   d. A structural abnormality th

**Match the terms in Column B to the de**

| | | A |
|---|---|---|
| 3. | ____ | 205-day weight |
| 4. | ____ | 365-day weight |
| 5. | ____ | A record of an animal's a |
| 6. | ____ | The amount of fat cover o |
| 7. | ____ | The appearance of a live |
| 8. | ____ | Measuring a cow's product performance of its offspr |
| 9. | ____ | The evaluation of a bull' the performance of its of |
| 10. | ____ | A method of collecting re for the selection of the beef animals. |

Name_____

Date_____

ock Selection

EVALUATION

**correct answer.**

conformation produce?

high-priced cuts and a maximum of bone and internal

high-priced cuts and a minimum of bone and internal

high-priced cuts and a maximum of bone and internal

high priced cuts and a minimum of bone and internal

lism in a bull?

tion
eral disease
here both testicles are retained within the body cavity
abnormality that prevents the bull from breeding

**n B to the descriptions in Column A.**

| A | B |
|---|---|
| ght | a. Condition |
| ght | b. Conformation |
| an animal's ancestors | c. Pedigree |
| f fat cover or finish | d. Performance testing |
| ce of a live animal | e. Progeny testing |
| cow's production by the of its offspring | f. Production testing |
| on of a bull's production by nce of its offspring | g. Weaning weight |
| collecting records to be used ction of the most productive . | h. Yearling weight |

## PERFORMANCE EVALUATION CALCULATIONS

A potential herd bull was born at 70 pounds from a 2-year-old cow. This bull was weaned at 520 pounds at 195 days of age. While on test for 165 days, he gained to the weight of 930 pounds and ate 3,690 pounds of feed.

1. What is the adjusted weaning weight for this bull?

2. If the herd's average adjusted weaning weight for bulls was 550 lbs., what was the bull's weaning weight ratio?

3. What was the adjusted yearling weight for this bull?

4. If the herd's average adjusted weaning weight for bulls was 925 pounds, what was the bull's yearling weight ratio?

5. What was the bull's average daily gain while on test?

6. What was the bull's feed efficiency while on test?

UNIT - ADVANCED BEEF

Lesson 11: Breeding Systems

Objective: The student will be able to describe the different breeding systems for beef.

Study Questions

1. **What time of year should cows and heifers be bred for best returns?**
2. **What can be done at breeding to produce a more uniform calf crop?**
3. **What are the advantages and disadvantages of using artificial insemination?**
4. **What are the advantages of crossbreeding?**
5. **What factors should be considered in planning a crossbreeding program?**
6. **What are the advantages and disadvantages of purebreeding?**

References


1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.
2. Gillespie, James R. Modern Livestock & Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 10: Animal Breeding Systems and Unit 13: Feeding and Management of the Cow-Calf Herd
3. "Inbreeding: Its Meaning, Uses and Effects on Farm Animals" (G2911). University of Missouri-Columbia: Extension Division, 1986. (optional)

UNIT - ADVANCED BEEF

Lesson 11: Breeding Systems

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Robin has a cow herd which she is ready to have bred. She would like to raise the best herd possible to increase the profitability of this herd. What will influence the profits? When should she breed her cows to the bull(s)? What management practices at breeding may also increase her profits?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students when calves are born in the area. Establish that calves are usually born in either the spring or fall. Have the students list advantages to each system that would lead to a more profitable herd.

**What time of year should cows and heifers be bred for best returns?**

a) During June and July for spring calving
   1) Dry cows may be more cheaply wintered.
   2) Calves are old enough to withstand the winter better.
   3) Cows milk better on grass than hay.
   4) Calves may be sold at weaning without wintering.
   5) Cows are bred while on pasture to increase conception rates.
   6) Calves usually will not require creep feeding.

b) During December and January for fall calving
   1) Cows are usually in better condition at calving, producing stronger calves.
   2) Young calves are not subjected to midsummer problems such as severe heat, pinkeye and flies.
   3) Calves can be weaned onto springtime grass for better gains.
   4) Cows calving during the fall grass regrowth are able to meet the nutritional requirements for good reproductive condition.
   5) Cattle numbers are largest during winter months when labor is usually more available.

6) Creep feeding is usually more profitable.
7) Calves are weaned when yearly markets are usually better.
8) Calves are usually born in milder weather.

c) Dual calving season system
1) Allows better utilization of facilities and feed resources
2) Provides for better utilization of bull power
3) Provides better marketing options
4) Allows heifers to calve at 2 1/2 instead of 2 or 3 years of age
5) Spreads labor requirement over the year

2. Ask the students what they could do to produce a more uniform calf crop.

**What can be done at breeding to produce a more uniform calf crop?**

a) A 40-60 day breeding season for a short calving season
b) Mating system which produces calves of similar type and breeding
c) Synchronization
d) Nutritional status or condition of cow
e) Purebred bull
f) Uniform cow herd (frame)
g) Use of sufficient number of bulls

3. Ask the students what benefits can be realized from using artificial insemination. Then ask the students what may limit the breeder's utilization of artificial insemination.

**What are the advantages and disadvantages of using artificial insemination?**

a) Advantages of A.I.
1) Allows the use of genetically superior sires without the cost of owning them
2) May allow the elimination of a bull from small herds
3) Reduces the spread of disease through improved reproductive herd health
4) Provides a tool for better utilization of crossbreeding
5) Allows for the use of a bull after an injury or its death
6) Improves records for performance testing
7) Increases the number of cows which can be bred to superior bulls

b) Disadvantages of A.I.
1) Requires good management practices
2) Requires a good nutrition program
3) Requires good facilities for the insemination
4) Requires a short breeding season and may require the use of estrus synchronization
5) Requires a well-trained inseminator
6) Increased labor requirements

4. Ask the students why many beef producers practice the use of crossbreeding to increase the profitability of their herds.

**What are the advantages of crossbreeding?**

a) Heifers reach puberty and conceive earlier.
b) Heifers experience increased conception during their first estrus.
c) There is a lower incidence of embryonic mortality with crossbreeding.
d) Fewer calves are lost from birth to weaning.
e) Calves have a faster growth rate.
f) Cows rebreed faster after calving.
g) Cows have a longer reproductive life.

5. Have the students set up a crossbreeding program for a beef herd. Ask the students to determine alternatives to their system.

**What factors should be considered in planning a crossbreeding program?**

a) Breeds
    1) Number of breeds
    2) Strong points of each breed to be used
    3) Order of the breeds to be used
    4) Availability of the breeds
    5) Acceptability to buyers
    6) Environmental conditions
    7) Feed resources
b) Management of program
    1) Obtaining replacements
        (a) Raised
        (b) Purchased
    2) Method of breeding
        (a) Pasture
        (b) Hand breeding
        (c) Artificial insemination

6. Ask the students why beef producers would raise purebred cattle. Then discuss with students the reasons that everyone doesn't raise purebreds.

**What are the advantages and disadvantages of purebreeding?**

a) Advantages
    1) Tends to make desirable traits more visible
    2) Can trace ancestors
    3) Allows for breeding options
        (a) Inbreeding mates related animals.
            (1) Closebreeding mates animals with more than one common ancestor.

(2) Line breeding mates animals with one common ancestor.

(b) Outcrossing mates animals of different families of the same breed.

(c) Line crossing mates animals of different breeding lines within a breed.

4) Provides breeding animals for other producers

b) Disadvantages

1) Tends to make undesirable traits more visible
2) Some animals not eligible for registration
3) Requires more capital for breeding animals
4) Less efficiency with reproductive traits

F. Other activities

G. Conclusion

The goal of any breeding system is to produce the highest quality beef animals that will make the most efficient gains at the lowest possible cost.

H. Competency

Describe the different breeding systems for beef.

I. Answers to Evaluation

1. a
2. a
3. b
4. a
5. b
6. d
7. d
8. b
9. d
10. a

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 11: Breeding Systems

EVALUATION

**Circle the letter which corresponds to the best answer.**

1. Which of the following is true of cows bred to calve in the spring?

   a. Dry cows may be more cheaply wintered.
   b. Calves are usually born in better weather.
   c. Cows are usually in better condition at calving.
   d. Cows give more milk on dry feeds.

2. Which of the following is true of cows bred to calve in the fall?

   a. Calves may be weaned onto springtime grass for better gains.
   b. Creep feeding is usually not profitable.
   c. Cows would be bred while on early spring grass for better conception.
   d. Young calves are subjected to the severe heat, pinkeye and flies of midsummer.

3. How does crossbreeding affect the efficiency of cows?

   a. Decreases feed efficiency
   b. Increases reproductive efficiency
   c. Decreases milk production
   d. Decreases reproductive efficiency

4. What type of breeding involves any type of mating animals of different breeds?

   a. Crossbreeding
   b. Inbreeding
   c. Line crossing
   d. Purebreeding

5. What type of breeding involves mating animals with one common ancestor?

   a. Crossbreeding
   b. Line breeding
   c. Line crossing
   d. Outcrossing

6. What type of breeding involves mating animals of different families of the same breed?

   a. Crossbreeding
   b. Inbreeding
   c. Line crossing
   d. Outcrossing

7. What type of breeding involves mating animals of different breeding lines within a breed?

   a. Crossbreeding
   b. Inbreeding
   c. Line breeding
   d. Line crossing

8. What type of breeding involves mating related animals?

   a. Crossbreeding
   b. Inbreeding
   c. Outcrossing
   d. Purebreeding

9. What type of breeding involves any type of mating animals of the same breed?

   a. Crossbreeding
   b. Inbreeding
   c. Outcrossing
   d. Purebreeding

10. Which of the following is <u>not</u> a requirement for artificial insemination?

    a. Estrus synchronization
    b. A well-trained inseminator
    c. A good nutrition program
    d. Facilities for the insemination

UNIT - ADVANCED BEEF

Lesson 12: Beef Facilities

Objective: The student will be able to evaluate the different facilities for producing beef.

Study Questions

1. **What should be considered when planning a beef facility?**
2. **What facilities are required to maintain a beef enterprise?**
3. **What facilities and equipment may be used to feed the beef herd?**
4. **What facilities and equipment are needed for working with beef animals?**

References


1. Gillespie, James R. Modern Livestock & Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 16: Beef Housing and Equipment
2. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.
3. Bundy, Diggins & Christensen. Livestock and Poultry Production, 5th ed. Englewood Cliffs, NJ: Prentice-Hall, 1982. (optional)
4. Transparency Master
   a) TM 12.1: Mounds for Feedlots

UNIT - ADVANCED BEEF

Lesson 12: Beef Facilities

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Linda Learning has purchased a farm and wants to begin a beef enterprise. She would like to know what facilities she will require. What equipment will she need to manage her herd? What could she do to make her enterprise more efficient?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students what factors should be considered for a beef enterprise.

**What should be considered when planning a beef facility?**

a) Type of cattle enterprise
b) Number of cattle to be managed
c) Land needed to provide required space
d) Type of facility to be used
e) Facility location
f) Environmental requirements
g) Feed storage and handling
h) Available money and labor
i) Coordination of existing facilities with new facilities
j) Room for expansion

2. Ask the students what facilities are needed to support a beef enterprise.

**What facilities are required to maintain a beef enterprise?**

a) Type of facilities
    1) Confinement
        (a) Cold
        (b) Warm
    2) Feedlot
        (a) Open feedlot
        (b) Barn and feedlot

(c) Feeding barn and lot
3) Pasture

b) Space requirements (per head)
1) Confinement
(a) Solid floor requires 30 square feet.
(b) Solid floor with flushing system requires 17-18 square feet.
(c) Slotted floor requires 17-18 square feet.
2) Feedlot
(a) Unsurfaced feedlot requires 150-800 square feet.
(b) A partially surfaced feedlot requires 150 square feet.
(c) A sheltered surfaced feedlot requires 30 square feet within the shelter and 20 square feet outside it.
(d) Surfaced feedlots require 50 square feet.
3) Pasture requirements (variable)
(a) Type of plants
(b) Growth stage of plant species
(c) Soil fertility
(d) Climate
(e) Grazing system
(f) Season

c) Fences
1) Boundary
2) Cross
3) Electric

d) Shelters usually not necessary except for protection from extreme weather
1) Windbreaks
(a) Trees
(b) A high board fence
(c) Natural windbreaks like hills
2) Shade
(a) Trees
(b) Artificial shade
3) Housing sometimes required for calving during cold months
4) Special pens for some enterprises
(a) Bull pen
(b) Sick pens
(c) Calving pens
(d) Breeding pens
(e) Isolation pens

3. Ask the students what facilities and equipment are required for a beef enterprise. Discuss the reasons for having other feeding equipment.

**What facilities and equipment may be used to feed the beef herd?**

a) Feed bunks
1) Portable lot bunks
2) Fenceline bunks

3) Covered bunks
4) Mechanical bunks
5) Self-feeders
6) Creep feeders

b) Hay feeders
c) Mineral feeders
d) Storage facilities
1) Upright silos
(a) Conventional silo
(b) Cas-tight silo
2) Horizontal silos
(a) Trench
(b) Bunker
(c) Stack type
3) Metal bins
(a) Grain storage
(b) Protein storage
4) Hay storage
(a) Barns
(b) Shelter
(c) Covered stack
(d) Round bales stored in the open (some space between each bale)

e) Feed processing and handling
1) Portable grinding and mixing equipment
2) Feeding center
(a) Grinder
(b) Mixer
(c) Storage for supplements and additives to be mixed in the feed
3) Mechanized equipment to reduce labor
(a) Augers
(b) Elevators
(c) Conveyers

4. Have the students make a list of management practices that require handling the cattle. Discuss the equipment used to accomplish these tasks.

**What facilities and equipment are needed for working with beef animals?**

a) Some management practices require handling cattle.
1) Unloading and loading
2) Vaccinating
3) Administering medications
4) Treating wounds
5) Sorting
6) Weighing
7) Applying insecticides
8) Branding, ear notching or ear tagging
9) Castrating

10) Dehorning
11) Testing for pregnancy, etc.

b) A corral may be designed for the required handling in a beef enterprise.
   1) Pens
      (a) Holding pens may be equipped for feeding and watering.
      (b) Crowding pens to force cattle into chutes should be curved for easier handling.
   2) Chutes
      (a) Loading chutes for loading and unloading cattle
      (b) Working chute equipped with a headgate for treating cattle
      (c) All chutes narrow enough to keep animals from turning in them
   3) Gates for sorting and blocking
   4) Scales
   5) Dipping vat
   6) Portable corrals

F. Other activities

G. Conclusion

A beef enterprise does not require a great deal of facilities or equipment, but a properly equipped facility reduces labor requirements at a proportionate expense.

H. Competency

Evaluate the different facilities for producing beef.

I. Answers to Evaluation

| | | | |
|---|---|---|---|
| 1. | b | 6. | e |
| 2. | b | 7. | a |
| 3. | a | 8. | d |
| 4. | d | 9. | c |
| 5. | a | 10. | b |

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 12: Beef Facilities

EVALUATION

**Multiple choice: circle the letter of the best answer.**

1. Which of the following beef enterprises may be managed with the fewest facilities?

   a. Confinement operation
   b. Cow-calf operation
   c. Open barn and feedlot operation
   d. Open feedlot operation

2. How should the facilities be built?

   a. Upwind from the farmstead
   b. To allow for future expansion
   c. Near streams to carry away waste
   d. Away from good roads for security

3. Which of the following is required of all beef enterprises?

   a. Fences
   b. Lagoon
   c. Bull pen
   d. Protection barn

4. Which of the following may be used for herd disease control?

   a. Breeding pens
   b. Bull pens
   c. Calving pens
   d. Isolation pens

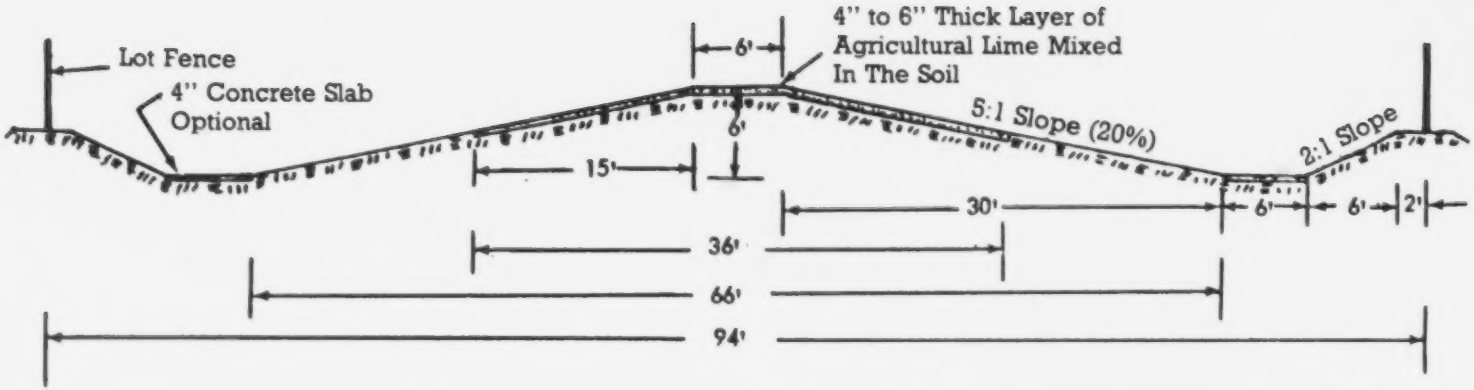
5. Which of the following may be used to store grain and protein?

   a. Metal bins
   b. Upright silos
   c. Trench silos
   d. Stack silos

**Matching**

| | | | | |
|---|---|---|---|---|
| 6. | ____ | Used to determine rate of gain | a. | Crowding pen |
| 7. | ____ | Used to force cattle into chutes | b. | Dipping vat |
| 8. | ____ | Used for receiving and shipping cattle | c. | Headgate |
| 9. | ____ | Used to restrain cattle for treating wounds, dehorning, etc. | d. | Loading chute |
| 10. | ____ | Used to apply insecticides | e. | Scales |

# Mounds for Feedlots




**Credit:** Missouri Cattle Feeder's Manual (Manual 65). University of Missouri-Columbia: Extension Division, 1983.

TM 12.1

UNIT - ADVANCED BEEF

Lesson 13: Beef Herd Health Programs

Objective: The student will be able to develop a herd health program for the different beef enterprises.

Study Questions

1. **What are the major causes of beef diseases?**
2. **What are the causes, symptoms and treatment of Missouri's major cattle diseases?**
3. **What are the major parasites of Missouri cattle and how are they controlled?**
4. **What is required to protect cattle from these diseases and parasites?**

References


1. Gillespie, James R. Modern Livestock & Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 15: Diseases and Parasites of Beef Cattle
2. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

UNIT - ADVANCED BEEF

Lesson 13: Beef Herd Health Programs

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Kent Kalill has a herd of sick cattle. What could be causing the illness? How are cattle diseases identified? What losses may Kent incur due to illness in the herd? What should be done to avoid such problems? Emphasize the importance of a proper vaccination program in order to avoid many illness complications. Consult a local veterinarian for suggested vaccinations for the area.

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students what causes beef cattle to become sick.

**What are the major causes of beef diseases?**

a) Bacteria
b) Viruses
c) Parasites
d) Chemicals
e) Poisons
f) Improper nutrition
g) Injuries

2. Ask the students what diseases affect beef cattle in the area. Discuss the causes, symptoms and treatments for local diseases.

**What are the causes, symptoms and treatment of Missouri's major cattle diseases?**

a) BRSV (Bovine Respiratory Syncytial Virus)
   1) May affect cattle of all ages as an individual disease or as part of the bovine respiratory disease complex (see BRD); virus-caused

2) Two types of symptoms
   (a) Initial infection: rapid breathing, coughing, nasal and eye discharge, fever of 104-109 F, slight swelling in jaw and neck area. Can strip hair-like projections lining respiratory tract and extensively damage surface cells
   (b) Rapid worsening of early symptoms, depression and dehydration, death sometimes within 48 hours of first signs
3) Treatment
   (a) Prevention through vaccination
   (b) Treat with antibiotics, sulfa drugs, antihistamines and anti-inflammatory drugs

b) Bovine Virus Diarrhea (BVD)
1) Caused by a contagious virus
2) Symptoms
   (a) Mild cases: no symptoms, fever, coughing, nasal discharge, slow gains, rapid breathing or mild diarrhea
   (b) Acute cases: fever, difficult breathing, discharges from nose and mouth, coughing, ulcers on the mouth, lameness, dehydration, weight loss, diarrhea and abortions
   (c) Chronic cases: slow gains, rough hair coat and lameness
3) Treatment
   (a) No cure, but cattle can be treated for diarrhea and secondary infections.
   (b) Vaccinate for prevention.

c) Brucellosis
1) Causes
   (a) Food or water contaminated by bacteria
   (b) Contact with infected bull or with aborted fetus
   (c) Introduction of infected animals to herd
2) Symptoms: abortions, infertility, retained afterbirth, weak calves and decreased milk production. Contagious to humans (undulant fever)
3) Treatment
   (a) No cure
   (b) Isolation, testing, calf vaccination and eradication for prevention

d) Bloat
1) Causes
   (a) Consumption of two much lush legume forage
   (b) A growth or obstruction of the esophagus that prevents the animal from expelling gases from the rumen
2) Symptoms
   (a) Distension of the upper left side of the abdomen
   (b) Rapid breathing and uneasiness
   (c) Suffocation if intense enough pressure
3) Treatment
   (a) Walking the animal if pressure is not too great

(b) Releasing gas by stomach tube or large needle
(c) Controlling legume intake for prevention

e) Calf scours
1) Causes
(a) Virus
(b) Bacteria
(c) Lack of colostrum
(d) Dirty feeding equipment
(e) Too much milk
2) Symptoms
(a) Acute cases: diarrhea and sudden death
(b) Chronic cases: diarrhea, loss of weight and death after several days
3) Treatment
(a) Antibiotics and sulfa drugs for cows
(b) Special feeding formula for calves
(c) Good sanitation for prevention

f) Clostridial diseases (includes blackleg; malignant edema; novyi; sord; red water; and enterotoxemia B, C or D)
1) Cause: highly resistant bacteria
(a) Usually enters body through mouth and wounds from contaminated soil, hay, feed
(b) Can be dormant
(c) Grow when oxygen is absent in soil or in an injured area of an animal where cells have been destroyed
2) Symptoms dependent on type of infected tissue; usually culminates in rapid death
3) Treatment
(a) Massive doses of antibiotics in early stages
(b) Vaccination for prevention

g) Fescue toxicity (summer slump, fescue foot and fat necrosis)
1) Cause
(a) Summer slump: fungal endophyte in tall fescue
(b) Other types: unknown
2) Symptoms
(a) Reduced feed consumption
(b) Decreased rate of gain or milk production
(c) Rough coat
(d) Increased respiration and temperature
(e) Nervousness
3) Treatment
(a) Remove from tall fescue
(b) Feed some grain in diet
(c) Prevention: mix legumes with fescue, reseed pasture with endophyte-free variety of fescue, avoid heavy fertilizer applications

h) Foot rot
1) Caused by bacteria, fungi and other organisms that enter a foot wound
2) Symptoms
(a) Lameness, redness between claws accompanied by foul odor

(b) Loss of appetite
(c) Fever and depression
(d) Death

3) Treatment
(a) Massive dosages of penicillin or wide-spectrum antibiotics
(b) Sulfa drugs
(c) Cleaning and treating of foot
(d) Good sanitation for prevention

i) Founder (laminitis)
1) Caused by overeating
2) Symptoms of lameness, inflammation between the bony part of the foot and the hoof wall, and toes that grow long and turn up
3) Treatment
(a) Trim toes and sell for slaughter
(b) Control feed intake for prevention

j) Grass tetany
1) Caused by a magnesium deficiency, especially with rapidly growing cool-season grasses
2) Symptoms of excitement, coordination loss, blindness, appetite loss and sometimes death
3) Treatment
(a) Inject calcium and magnesium solution
(b) Prevention: mixing legumes in the pasture; supplementing with magnesium; or feeding alfalfa, clover or other legumes

k) Hardware disease
1) Caused by a sharp object puncturing the wall of the reticulum where the object or the infection affects surrounding organs
2) Symptoms of appetite loss, arched back, fever, stiffness and reduction in cud chewing
3) Treatment
(a) Surgery
(b) Object-free feed or a magnet placed in the cow's stomach for prevention

l) Infectious Bovine Rhinotracheitis (IBR)
1) Caused by a virus; often the initial cause of shipping fever
2) Symptoms
(a) Respiratory IBR (red nose): fever, nasal discharge, foaming at the mouth, breathing through the mouth, weight loss, inflamed nose
(b) Genital IBR
(1) Infectious Pustular Vaginitis (IPV): inflamed vagina, swollen vulva, pustules in the vagina and pustular discharge
(2) Infectious Pustular Balanoposthitis (IPB): inflamed sheath and penis, lesions forming on penis accompanied by pus-like discharge

(c) Conjunctival IBR: a clear discharge from the eye that becomes pus-infected similar to pinkeye
(d) Abortions with any of the above types, even without additional symptoms
(e) Encephalitic IBR: incoordination, depression, convulsions and death

3) Treatment
(a) No treatment
(b) Antibiotics and sulfonamides for secondary infections
(c) Vaccination with modified live virus for prevention

m) Johne's (pronounced Yohneez) disease (paratuberculosis)
1) Caused by organisms in pastures, water sources and feed bunks contaminated by droppings from infected animals
2) Symptoms
(a) Long incubation period; disease usually not detectable in animals under two years old
(b) Intermittent diarrhea, weight loss and eventual death
3) Treatment
(a) No effective treatment
(b) Prevention by control of animals entering the herd

n) Leptospirosis
1) Caused by leptospira bacteria in feed and water; carried by wild animals
2) Symptoms
(a) Mild cases: no symptoms
(b) Acute cases: fever, rapid breathing, appetite loss, stiffness, bloody urine, jaundice, diarrhea or abortions
(c) Death rate of 5-15%
(d) Contagious to humans
3) Treatment
(a) Streptomycin
(b) Good sanitation and yearly vaccinations for prevention

o) Lumpy jaw
1) Caused by an organism that enters wounds in the mouth
2) Two types (consult veterinarian to diagnose)
(a) Chronic: swelling and abscess around jaw bone or bony tissues of head
(b) "Wooden tongue:" affects soft tissues and lymph nodes
3) Early treatment critical

p) Nitrate poisoning
1) Caused by too much nitrate in feed or water, especially with crops grown under drought conditions
2) Symptoms of difficult breathing, fast pulse rate, abortions and frothing at the mouth
3) Treatment
(a) Antidote tablets
(b) Analyze feeds for prevention

q) Pinkeye (infectious keratitis or keratoconjunctivitis)
   1) Causes
      (a) Bacteria carried by insects (usually face flies)
      (b) Virus with the form of IBR
      (c) Severity and susceptibility affected by bright sunlight, dust, pollen and Vitamin A deficiency
   2) Symptoms: watery eyes, swelling and ulcerations of the cornea which may spread from one eye to the other
   3) Treatment
      (a) Apply antibiotics and sulfa drugs to the eyelid frequently and possibly patch the eye
      (b) Vaccinate to lessen severity
      (c) Prevention by insect control and selection of animals with pigmented eyelids

r) Pneumonia
   1) Caused by an infection in the lungs
   2) Symptoms of labored, rapid breathing; coughing; fever; weakness and appetite loss
   3) Treatment
      (a) Antibiotics and sulfa drugs
      (b) Prevention by good sanitation and draft control

s) Ringworm
   1) Caused by a fungus
   2) Symptoms include round, scaly patches which lack hair
   3) Treatment
      (a) Antibiotics and sulfa drugs
      (b) Prevention by vaccination and management to reduce stress

t) Shipping fever (PI-3, pasteurella, IBR)
   1) Caused possibly by a combination of stress, viral infection and bacteria infection
   2) Symptoms of fever, depression, drooping head and ears, nasal discharge, watery eyes, weight loss, diarrhea, appetite loss, difficult breathing, coughing and development of pneumonia
   3) Treatment
      (a) Antibiotics and sulfa drugs
      (b) Prevention by vaccination and management to reduce stress

u) Sorghum and sudangrass poisoning
   1) Caused by high content of hydrocyanic or prussic acid in these plants under some conditions
   2) Symptoms of rapid breathing and death
   3) Treatment
      (a) Intravenous injection of sodium thiosulfate and methylene blue
      (b) Prevention by preventing consumption of wild cherry foliage or sorghum during severe drought or after frosts

v) TEME (thromboembolic meningoencephalitis)
   1) Caused by same bacteria which causes BRD

2) Symptoms
   (a) Early: lameness, reluctance to move, stiffness with "knuckling" of the fetlocks, blindness
   (b) Advanced: muscle tremors and paddling movements of down cattle; death
3) Treatment
   (a) Antibiotics in early stages
   (b) Vaccinate for prevention

w) Venereal diseases (vibriosis and trichomoniasis)
1) Causes (spread by breeding)
   (a) Vibriosis: bacteria
   (b) Trichomoniasis: one-celled animal
2) Symptoms of infertility, abortions and irregular heat periods in cows
3) Treatment (lab testing necessary for diagnosis)
   (a) Vibriosis
      (1) Vibriosis can be prevented through vaccination.
      (2) Cows will naturally rid themselves of the disease within a year after breeding and will retain immunity.
      (3) Antibiotics can be used to treat bulls.
   (b) Trichomoniasis
      (1) No cure
      (2) Slaughter recommended for control

x) Warts
1) Warts are contagious and are caused by a virus that spreads through contact.
2) Symptoms include hard or soft warts on the head, neck, shoulders, udder or teats of cattle.
3) Treat with the use of vaccine.

3. Discuss with the students what parasites are, and what types of parasites attack beef cattle. Discuss the control measures used to combat those parasites.

**What are the major parasites of Missouri cattle and how are they controlled?**

a) Types of external parasites
1) Flies
   (a) Black flies
   (b) Face flies
   (c) Heel flies (grubs)
   (d) Horn flies
   (e) Horseflies and deer flies
   (f) House flies
   (g) Stable flies
2) Lice
3) Mites (sarcoptic mange or cattle scab)
4) Mosquitoes
5) Screwworms
6) Ticks

b) Control of external parasites
    1) Insecticides
        (a) Sprays
        (b) Dips
        (c) Back rubbers
        (d) Pours
        (e) Dusts
        (f) Ear tags
    2) Good sanitation
    3) Pasture rotation
    4) Pasture drainage
    5) Injections

c) Types of internal parasites
    1) Roundworms
        (a) Stomach worms
        (b) Nematodirus
        (c) Threadworm
        (d) Hookworm
        (e) Cooperia
        (f) Nodular worm
        (g) Whipworm
        (h) Lungworm
    2) Flatworms
        (a) Tapeworms
        (b) Deer liver fluke
    3) Coccidia
    4) Anaplasma (blood parasite transmitted by horseflies)

d) Control of internal parasites
    1) Chemicals
        (a) Boluses (large pills)
        (b) Drenches
        (c) Feed additives
    2) Isolation or elimination of infected animals from herd
    3) Good sanitation
    4) Pasture drainage
    5) Pasture rotation
    6) Injections

4. Ask the students what steps can be taken to maintain a disease- and parasite-free herd?

**What is required to protect cattle from these diseases and parasites?**

a) Screen all animals entering the herd for diseases and parasites.
b) Maintain cattle lots and pastures to be free of stagnant water.
c) Isolate infected animals from the herd.
d) Isolate new animals until they appear disease-free.
e) Have breeding herd tested for disease regularly.
f) Vaccinate for diseases common in the area.
g) Disinfect equipment and housing regularly.

h) Disinfect open wounds and navels of newborn calves.
i) Provide exercise for the breeding herd.
j) Apply insecticides for external parasite control.
k) Eliminate manure piles and other materials for insect reproduction.
l) Provide pure, clean water.

F. Other activities

G. Conclusion

The health of the beef herd is important to reduce loss of gain or the individual to maintain efficient production.

H. Competency

Develop a herd health program for the different beef enterprises.

I. Answers to Evaluation

1. a
2. d
3. c
4. b
5. a
6. d
7. b
8. d
9. b
10. c

Name_____

UNIT - ADVANCED BEEF Date_____

Lesson 13: Beef Herd Health Programs

EVALUATION

**Circle the letter of the correct answer.**

1. Which of the following should herd replacements be tested for?

   a. Brucellosis
   b. Fescue foot
   c. Hardware disease
   d. Sorghum and sudangrass poisoning

2. Which of the following will a cow cure itself of within one year?

   a. IBR
   b. Blackleg
   c. Lumpy jaw
   d. Vibriosis

3. Selection of animals with pigmented eyes may prevent problems with what disease?

   a. Bloat
   b. BVD
   c. Pinkeye
   d. Shipping fever

4. Which of the following is thought to be caused by a combination of stress, a viral infection and a bacterial infection?

   a. Ringworm
   b. Shipping fever
   c. Warts
   d. White muscle disease

5. Which of the following lay eggs on cattle that develop into grubs?

   a. Heel flies
   b. Horn flies
   c. Screw flies
   d. Ticks

6. Which of the following lay eggs in wounds of cattle that develop into maggots which infect the wound?

   a. Black flies
   b. Heel flies
   c. Houseflies
   d. Screw flies

7. Which of the following is the cause of sarcoptic mange or cattle scab?

   a. Lice
   b. Mites
   c. Mosquitoes
   d. Stable flies

8. Which of the following is a flatworm that may infect beef cattle?

   a. Hookworms
   b. Lungworm
   c. Stomach worms
   d. Tapeworms

9. Which are four causes of cattle diseases?

   a. Bacteria, chemicals, poor weather, improper nutrition
   b. Viruses, poisons, improper nutrition, injuries
   c. Parasites, poisons, feed additives, injuries
   d. Viruses, poisons, improper nutrition, poor ventilation

10. Which are four types of insecticides used to combat external parasites?

    a. Sprays, dips, injections, dusts
    b. Dips, back rubbers, ear tags, implants
    c. Sprays, pours, dusts, ear tags
    d. Back rubbers, supplements, pours, ear tags

UNIT - ADVANCED BEEF

Lesson 14: Feedstuffs for Balanced Rations

Objective: The student will evaluate feedstuffs for the most profitable ration.

Study Questions

1. **How are minimum nutritional requirements determined?**
2. **What should be included in beef feed supplements?**
3. **How can the quality of feed and hay be determined?**
4. **What determines the ingredients to be included in a ration?**
5. **When should calves be creep fed?**

References

1. Gillespie, James R. Modern Livestock & Poultry Production, 2nd ed. Albany, NY: Delmar, 1983. Unit 13: Feeding and Management of the Cow-Calf Herd and Unit 14: Feeding and Management of Feeder Cattle
2. Work Sheets
   a) WS 14.1: Beef Calf Nutrition Work Sheet
   b) WS 14.2: Beef Cow Nutrition Work Sheet

UNIT - ADVANCED BEEF

Lesson 14: Feedstuffs for Balanced Rations

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Matt Manager has just obtained a job managing a beef farm which has a cow-calf herd. The calves from this herd are retained and fed to market weight. Matt will be responsible for developing rations that efficiently provide for the cattle's nutritional needs. What information will be needed to fulfill his job responsibilities?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students how a cattle producer may determine the nutritional needs of his cattle. Utilize WS 14.1 and 14.2 for practice in evaluating rations, for nutritional adequacy and cost efficiency. For work with balancing rations, use UMC Extension Division Guide 2052: Formulating rations for beef cattle.

**How are minimum nutritional requirements determined?**

a) Sources of nutrient requirement information
   1) Animal observation
   2) Nutrient requirement tables
b) Factors affecting nutrient requirements
   1) Size of the animal
   2) Level of production
      (a) Meat production
      (b) Milk production
      (c) Fetal development
   3) Age
   4) Sex
   5) Environmental conditions
      (a) Temperature
      (b) Mud
      (c) Wind
      (d) Rain
   6) Body condition
c) Nutrients required
   1) Water

(a) A deficiency will result in death faster than any other nutrient deficiency.
(b) Water is supplied through drinking water and moisture in feed.

2) Energy
   (a) Sources: carbohydrates and fats in roughages and concentrates
   (b) Energy breakdown for use
      (1) Gross energy is the total energy in the feed.
      (2) Digestible energy is the gross energy minus the energy lost in the feces.
      (3) Metabolizable energy is the digestible energy minus the energy lost in urine and gases in the form of heat.
      (4) Net energy is the metabolizable energy minus the energy lost in the form of heat.
   (c) Animal uses of energy
      (1) Maintenance of body tissues
      (2) Growth
      (3) Fattening
      (4) Fetal development
      (5) Milk production

3) Protein
   (a) Protein is provided to animals in roughages, concentrates, supplements and blocks.
   (b) Crude protein is the total protein in the feed.
   (c) Digestible protein is that which the animal extracts from the feed.
   (d) Urea can be converted to protein through rumen action, but it may be toxic if fed in excess.
   (e) A minimum of 6% protein is required to maintain rumen microbial activity.

4) Minerals
   (a) Calcium, phosphorus, sodium, chlorine and sulfur are minerals required by cattle in comparatively large amounts.
   (b) Cobalt, iron, zinc, iodine, manganese, potassium, magnesium, copper and molybdenum are required in comparatively small amounts.
   (c) Mineral requirements can be met through feed concentrates, roughages and supplements.

5) Vitamins
   (a) A, D and E are required by cattle.
   (b) K and B complex vitamin requirements are met through synthesis in the rumen.

2. Ask the students if all cattle nutritional requirements can be met by any single feedstuff. Discuss the additional nutrients that need to be supplied and how they can be supplemented.

**What should be included in beef feed supplements?**

a) Energy supplement
   1) Required with cattle on low-energy forages resulting from drought or overstocking
   2) Required with cattle which have high-energy requirements, such as young calves or lactating cows
   3) May result in only small improvement in performance due to decreased roughage intake
b) Protein supplement
   1) First limiting nutrient in most diets
   2) May greatly increase forage intake
   3) Can increase the rate of digestion of forages
   4) Should be used only to meet requirements because of expense
c) Mineral and vitamin supplements
   1) Salt, calcium and phosphorus are the main minerals needed in the cattle ration.
   2) These minerals should be provided to avoid deficiencies.
      (a) In ration
      (b) Free-choice
   3) Vitamin supplements are seldom needed with cattle on good pasture.
      (a) Vitamin A for cattle on poor-quality dry forages
      (b) Vitamin D for animals that do not spend part of the day in sunlight
      (c) Vitamin E for animals on high-grain rations
d) Feed additives
   1) Hormones to increase rate-of-gains and efficiency
   2) Antibiotics to prevent disease, increase rate-of-gains and increase feed efficiency

3. Ask the students how the nutrient content of a feed or feed ingredient is determined.

**How can the quality of feed and hay be determined?**

a) Composition tables give an estimate of nutrient values and quality.
b) Feed analyses provide chemical make-up.
c) Cattle performance on the feed is the ultimate test.

4. Ask the students what they feed their cattle. Then ask them why they use these ingredients.

**What determines the ingredients to be included in a ration?**

a) Nutrient requirements of cattle
b) Ingredient choices
   1) Availability
   2) Composition
   3) Cost

4) Performance
   (a) Efficiency
   (b) Gains

5. Ask the students if suckling calves ever need supplemental feeding. Discuss how this is accomplished and when it may be profitable.

**When should calves be creep fed?**

a) Calves to be sold at weaning
b) Purebred calves for heavier weaning weights and extra bloom
c) Calves born in the fall or early winter
d) Calves on dry lot or poor pastures
e) Calves of poor milking cows
f) Early weaned calves
g) When heavier weight feeders sell for more than lightweight feeders
h) When grain prices are low relative to feeder calf prices

F. Other activities

G. Conclusion

Rations for cattle should provide the necessary nutrients at the lowest cost for efficient beef production.

H. Competency

Evaluate feedstuffs for the most profitable balanced ration.

I. Answers to Evaluation

| | | | |
|---|---|---|---|
| 1. | a | 6. | c |
| 2. | d | 7. | c |
| 3. | a | 8. | a |
| 4. | b | 9. | b |
| 5. | b | 10. | c |

J. Answers to work sheets

1. Work Sheet 14.1

1. 11.0
2. 7.41
3. 7.70
4. 4.84
5. .061
6. .028

7. Table 1:

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Yellow dent No. 2 corn | 88.0% | 10.1% | 1.02 Meal/lb. | .07 Meal/lb. | .02% | .35% |
| B. 10 lbs. corn | 8.8 lbs. | 1.01 lbs. | 10.2 Meal | .70 Meal | .002 lb. | .035 lb. |
| C. Alfalfa hay mid-bloom | 90.0% | 17.0% | .56 Meal/lb. | .31 Meal/lb. | 1.41% | .24% |
| D. 6 lbs. hay | 5.4 lbs. | 1.02 lbs. | 3.36 Meal | 1.86 Meal | .085 lb. | .014 lb. |
| E. Total Nutrients (B plus D) | 14.2 lbs. | 2.03 lbs. | 13.56 Meal | 2.56 Meal | .087 lb. | .049 lb. |

8. Table 2:

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Soft winter wheat | 88.0% | 11.4% | 1.00 Meal/lb. | .69 Meal/lb. | .05% | .43% |
| B. 10 lb. wheat | 8.8 lbs. | 1.14 lbs. | 10.00 Meal | 6.90 Meal | .005 lb. | .043 lb. |
| C. Sorghum meal | 89.0% | 44.4% | .84 Meal/lb. | .60 Meal/lb. | .29% | .63% |
| D. 1.5 lbs. SBM | 1.3 lbs. | .67 lb. | 1.26 Meal | .90 Meal | .004 lb. | .009 lb. |
| E. Full-bloom timothy hay | 89.0% | 8.1% | .54 Meal/lb. | .28 Meal/lb. | .43% | .20% |
| F. 5 lbs. hay | 4.45 lbs. | .41 lb. | 2.70 Meal | 1.40 Meal | .022 lb. | .010 lb. |
| G. Ration total (B + D + F) | 14.6 lbs. | 2.22 lbs. | 13.96 Meal | 9.20 Meal | .031 lb. | .062 lb. |

9. 30¢
10. 15¢
11. 45¢
12. 30¢
13. 2¢
14. 60¢
15. 92¢
16. Ration 2
17. Ration 2
18. Ration 1

2. Work Sheet 14.2

1. 20.2
2. 2.0
3. 11.11
4. 0
5. .056
6. .044

7. Table 1:

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Yellow dent No. 2 corn | 88.0% | 10.1% | 1.02 Meal/lb. | .07 Meal/lb. | .02% | .35% |
| B. 20 lbs. corn | 17.6 lbs. | 2.0 lbs. | 20.4 Meal | 1.40 Meal | .004 lb. | .07 lb. |
| C. Sorghum meal | 89.0% | 44.4% | .84 Meal/lb. | .60 Meal/lb. | .29% | .63% |
| D. 1 lb. SBM | .9 lb. | .4 lb. | .84 Meal | .60 Meal | .003 lb. | .006 lb. |
| E. Total Nutrients (B plus D) | 18.5 lbs. | 2.4 lbs. | 21.2 Meal | 2.0 Meal | .007 lb. | .076 lb. |

9. Table 2:

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Soft winter wheat | 88.0% | 11.4% | 1.00 Meal/lb. | .69 Meal/lb. | .05% | .43% |
| B. 21 lb. wheat | 19.4 lbs. | 2.5 lbs. | 22.00 Meal | 15.18 Meal | .011 lb. | .095 lb. |
| C. Soybean meal | 39.0% | 44.4% | .84 Meal/lb. | .60 Meal/lb. | .29% | .63% |
| D. .5 lbs. SBM | .4 lb. | .2 lb. | .42 Meal | .30 Meal | .001 lb. | .003 lb |
| E. Total Nutrients (B plus D) | 19.8 lbs. | 2.7 lbs. | 22.42 Meal | 15.40 Meal | .012 lb. | .098 lb. |

10. 63¢, 6¢, 69¢
11. Wheat
12. Wheat

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 14: Feedstuffs for Balanced Rations

EVALUATION

**Multiple choice: circle the letter of the most correct answer.**

1. Which of the following does not affect beef nutritional requirements?

   a. Acreage
   b. Age
   c. Production level
   d. Sex

2. A deficiency of what nutrient will cause death faster than any other nutrient?

   a. Carbohydrates
   b. Minerals
   c. Proteins
   d. Water

3. What environmental condition has the least affect on nutrient requirements?

   a. Humidity
   b. Mud
   c. Rain
   d. Wind

4. For rumen microbial activity maintenance, a cow requires what percent protein?

   a. 3
   b. 6
   c. 15
   d. 20

5. Which vitamin may need to be supplemented least in a beef ration?

   a. A
   b. B
   c. D
   d. E

6. What is the first limiting nutrient in most beef diets?

   a. Carbohydrates
   b. Fats
   c. Protein
   d. Vitamins

7. Which of the following will relate the actual nutritional contents of a ration?

   a. A microscope
   b. Composition tables
   c. Feed analysis
   d. Weight scales

8. What is a method of providing supplemental feed to calves for heavier weaning weights and extra bloom?

   a. Creep feeding
   b. Grazing
   c. Implants
   d. Injections

9. What types of nutrients provide energy in a ration?

   a. Minerals and fats
   b. Carbohydrates and fats
   c. Vitamins and minerals
   d. Carbohydrates and vitamins

10. During extremely cold weather, cattle should be given which of the following?

    a. Equal feed
    b. Less feed
    c. More feed
    d. No feed

## BEEF CALF NUTRITION WORK SHEET

Matt Manager finds that the following two rations meet the nutritional needs for 400-pound steer calves.

| Ration 1 | Ration 2 |
|---|---|
| 10 lbs. corn | 10 lbs. wheat |
| 6 lbs. alfalfa hay | 1.5 lbs. soybean meal |
| | 5 lbs. timothy hay |

**Fill in the blanks below** with appropriate nutrient requirements for a 400-pound steer gaining 2.0 pounds per day.

1. Dry matter ..... ____ lbs.
2. Protein ..... ____ lbs.
3. Net energy for maintenance ..... ____ meal
4. Net energy for gain ..... ____ meal
5. Calcium ..... ____ lb.
6. Phosphorus ..... ____ lb.

7. Complete the table below for the ingredients of Ration 1.

**TABLE 1 - Ration 1 ingredients**

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Yellow dent No. 2 corn | % | % | Meal/lb. | Meal/lb. | % | % |
| B. 10 lbs. corn | lbs. | lbs. | Meal | Meal | lb. | lb. |
| C. Alfalfa hay mid-bloom | % | % | Meal/lb. | Meal/lb. | % | % |
| D. 6 lbs. hay | lbs. | lbs. | Meal | Meal | lb. | lb. |
| E. Total Nutrients (B plus D) | lbs. | lbs. | Meal | Meal | lb. | lb. |

8. Complete this table for the ingredients of Ration 2.

**TABLE 2 - Ration 2 ingredients**

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Soft winter wheat | % | % | Meal/lb. | Meal/lb. | % | % |
| B. 10 lb. wheat | lbs. | lbs. | Meal | Meal | lb. | lb. |
| C. Sorghum meal | % | % | Meal/lb. | Meal/lb. | % | % |
| D. 1.5 lbs. SBM | lbs. | lb. | Meal | Meal | lb. | lb. |
| E. Full-bloom timothy hay | % | % | Meal/lb. | Meal/lb. | % | % |
| F. 5 lbs. hay | lbs. | lb. | Meal | Meal | lb. | lb. |
| G. Ration total (B + D + F) | lbs. | lbs. | Meal | Meal | lb. | lb. |

Use the following to determine the daily cost per head with each ration.

Ration 1

9. 10 lbs. corn at 3¢ per lb. ..... $_____
10. 6 lbs. alfalfa hay at 2.5¢ per lb. ..... _____
11. Cost of ration ..... _____

Ration 2

12. 10 lbs. wheat at 3¢ per lb. ..... $_____
13. 1.5 lbs. soybean meal at 1.5¢ per lb. ..... _____
14. 5 lbs. timothy hay at 12¢ per lb. ..... _____
15. Cost of ration ..... _____

16. Which ration will lead to the highest gains? ..... _____
17. Which ration may result in a calcium deficiency? ..... _____
18. Which ration will cost the least? ..... _____

## BEEF COW NUTRITION WORK SHEET

Matt Manager has found an energy supplement ration for his 1,000-pound cows of average milking ability that supports their suckling calves. Fill in the following for the cow's nutritional requirements.

1. Dry matter ..... ____ lbs.
2. Protein ..... ____ lbs.
3. Net energy for maintenance ..... ____ meal
4. Net energy for gain ..... ____ meal
5. Calcium ..... ____ lb.
6. Phosphorus ..... ____ lb.

7. The ration consists of a mixture of 20 lbs. corn, 1 lb. soybean meal, and vitamin and mineral supplements. Fill in the table below for the nutrients provided for by these ingredients.

**TABLE 1 - Corn ration nutrients**

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Yellow dent No. 2 corn | % | % | Meal/lb. | Meal/lb. | % | % |
| B. 20 lbs. corn | lbs. | lbs. | Meal | Meal | lb. | lb. |
| C. Sorghum meal | % | % | Meal/lb. | Meal/lb. | % | % |
| D. 1 lb. SBM | lb. | lb. | Meal | Meal | lb. | lb. |
| E. Total Nutrients (B plus D) | lbs. | lbs. | Meal | Meal | lb. | lb. |

8. What will this ration cost?

20 lbs. corn at 3¢ per lb. ..... $_____

1 lb. soybean meal at 12¢ per lb. ..... _____

Total cost of this ration ..... _____

Matt finds that he can obtain wheat for his ration at 3¢ per 1b. He determines that his ration would now need to consist of 21 lbs. wheat and .5 1b. soybean meal.

9. Complete the table below for the nutrients provided with these ingredients.

**TABLE 2 - Wheat ration nutrients**

| | Dry Matter | Protein | Net Energy - Maintenance | Net Energy - Gain | Calcium | Phosphorus |
|---|---|---|---|---|---|---|
| A. Soft winter wheat | % | % | Meal/lb. | Meal/lb. | % | % |
| B. 21 lb. wheat | lbs. | lbs. | Meal | Meal | lb. | lb. |
| C. Soybean meal | % | % | Meal/lb. | Meal/lb. | % | % |
| D. .5 lbs. SBM | lb. | lb. | Meal | Meal | lb. | lb |
| E. Total Nutrients (B plus D) | lbs. | lbs. | Meal | Meal | lb. | lb. |

10. What will this ration cost?

21 lbs. wheat at 3¢ per 1b. ..... $_____

.5 1b. soybean meal at 12¢ per 1b. ..... _____

Total cost of this ration ..... _____

11. Which ingredient produces the cheapest ration? ..... _____

12. Which ration has the most energy? ..... _____

UNIT - ADVANCED BEEF

Lesson 15: Pasture and Roughage Programs

Objective: The student will be able to plan a pasture and roughage program for profitable beef production.

Study Questions

1. **What problems can be experienced with cattle on pasture?**

2. **What roughages may be fed to beef cattle on pasture?**

3. **What determines the quality of a roughage feed?**

4. **What determines the quality of a grazing pasture?**

References

1. Advanced Beef (Selected Readings). University of Missouri-Columbia: Instructional Materials Laboratory, 1987.

2. Related materials available from IML

   a) Field Crops of Missouri instructional unit (AG-71-I)
   b) "Grasses and Legumes" slide set (AG-30-V)
   c) "Identification of Grasses and Legumes" illustrated booklet (AG-30-S)
   d) "Farm Crops Identification and Judging" publication (AG-20-S), UMC Extension Division
   e) "Seed Judging Classes" set of samples (AG-65-J)

UNIT - ADVANCED BEEF

Lesson 15: Pasture and Roughage Programs

TEACHING PROCEDURES

A. Review

Review previous lesson.

B. Motivation

Bob Beefherd has a beef enterprise in which he wishes to make maximum use of low-cost roughages. What roughages can he include in his feeds? How can he determine the quality of these roughages? What problems must he avoid?

C. Assignment

D. Supervised study

E. Discussion

1. Ask the students what problems can be experienced with cattle on a pasture and roughage program. A review of Lesson 13 on health programs may help with this part of the lesson.

**What problems can be experienced with cattle on pasture?**

a) Bloat
   1) Occurs more frequently on pasture consisting of 50% or more legumes
   2) Can result in suffocation caused by gas trapped in the rumen by a foaming action
   3) Control
      (a) Feed an anti-foaming agent
      (b) Provide an alternative roughage
      (c) Select against individuals that have the tendency to bloat

b) Poisonous plants
   1) Losses
      (a) Death
      (b) Reduced gains
      (c) Cattle treatment cost
      (d) Abortions
      (e) Birth defects
   2) Problems occurring with hungry cattle
      (a) Low-quality forage
      (b) Overgrazing
      (c) Dry weather

c) Prussic acid poisoning

1) Occurs with cattle on forages in the sorghum family
2) Accumulation of acid during extremely dry weather or frost-covered feedstuffs

d) Nitrate poisoning
1) Occurs on highly fertilized pastures
2) May occur when feeding green chop

e) Fescue toxicity
1) Cause associated with a fungus in some fescue
2) Common types
(a) Summer slump
(b) Fescue foot

f) Elemental deficiencies and imbalances, such as grass tetany

2. Review the terms roughage and concentrate. Discuss why people feed roughages to their cattle. Ask the students to develop a list of roughages that could be used for cattle feed.

**What roughages may be fed to beef cattle on pasture?**

a) Dry
1) Hay
2) By-products
3) Crop residue

b) Fresh or wet
1) Green chop
2) Silage
(a) Grass and legumes
(b) Haylage (low-moisture silage)
(c) Corn and sorghum silage

3. Ask the students if all cattle gain equally well on all roughages. Discuss the factors that determine the quality of a roughage feed. Ask how the quality of a roughage feed can be maximized.

**What determines the quality of a roughage feed?**

a) Digestibility
b) Protein content
c) Steps to maximize quality
1) Hay should be harvested at a compromise between increasing yield and decreasing digestibility.
2) Silage should be harvested to make efficient use of storage.
(a) Maximize dry matter per acre
(b) Maximize digestible nutrients
(c) Maximize dry matter stored per cubic foot
(d) Minimize seepage losses

4. Ask the students what determines the quality of a grazing pasture. Discuss factors that affect pasture quality and practices that can be implemented to improve it.

**What determines the quality of a grazing pasture?**

a) Plants
   1) Species
   2) Legumes
   3) Grasses
      (a) Warm season
      (b) Cool season
   4) Growth stage or maturity
b) Soil
   1) Fertility
      (a) Natural
      (b) Topdressing
   2) Texture
c) Environment
   1) Temperature
   2) Moisture
d) Weed control
   1) Mowing
   2) Grazing
   3) Herbicides
e) Grazing pressure
   1) Stalking rate
   2) Grazing system
      (a) Continuous
      (b) Controlled grazing
      (c) Grazing and resting
      (d) Strip
      (e) Stockpiling
      (f) Creep grazing

F. Other activities

Help students identify roughages from samples.

G. Conclusion

Cattle are capable of utilizing roughages that other animals are unable to live on. Through proper management practices of cattle, feeds and pasturelands, maximum efficiency can be obtained in the production of beef at a minimum cost.

H. Competency

Plan a pasture and roughage program for profitable beef production.

I. Answers to Evaluation

1. a
2. c
3. d
4. b

5. a
6. d
7. d
8. b
9. b
10. c

Name_____

UNIT - ADVANCED BEEF

Date_____

Lesson 15: Pasture and Roughage Programs

EVALUATION

**Multiple choice. Circle the letter which corresponds to the best answer.**

1. Alternate roughages should be provided for cattle on legume pastures to prevent which disease?

   a. Bloat
   b. Grass tetany
   c. Nitrate poisoning
   d. Prussic acid poisoning

2. What problem can be experienced by having cattle on highly fertilized pastures or green chop?

   a. Bloat
   b. Grass tetany
   c. Nitrate poisoning
   d. Prussic acid poisoning

3. What problem can be experienced with cattle on forages in the sorghum family during periods of extremely dry weather or after a frost?

   a. Bloat
   b. Grass tetany
   c. Nitrate poisoning
   d. Prussic acid poisoning

4. Interseeding legumes into fescue usually eliminates problems with which disease resulting from a magnesium deficiency?

   a. Bloat
   b. Grass tetany
   c. Nitrate poisoning
   d. Prussic acid poisoning

5. What is a low-moisture silage called?

   a. Haylage
   b. Pasture
   c. Green chop
   d. Corn silage

6. How is roughage quality determined?

   a. Texture and weight
   b. Yield and moisture
   c. Purity and maturity
   d. Digestibility and protein content

7. Under which condition are cattle <u>least</u> likely to eat poisonous plants?

   a. Dry weather
   b. Hungry cattle
   c. Overgrazed pastures
   d. High-quality forages

8. Which of the following is <u>not</u> a loss that can occur from poisonous plants?

   a. Abortions
   b. Commission
   c. Reduced gains
   d. Cattle treatment costs

9. Which of the following is <u>not</u> a type of dry roughage that can be fed to cattle?

   a. Hay
   b. Silage
   c. By-products
   d. Crop residues

10. Which of the following practices will <u>not</u> improve the quality of a pasture?

    a. Apply fertilizers
    b. Interseed grass pastures with legumes
    c. Allow pastures to achieve mature growth before grazing
    d. Mow pastures containing weeds before the weeds go to seed